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ANNUAL REPORT



OF THE

SUPERVISING SURGEON-GENERAL

OF THE

MARINE-HOSPITAL SERVICE OF THE UNITED STATES

FOR THE

FISCAL YEAR 1899.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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TREASURY DEPARTMENT,

Document No. 2236.

Office of U. S. Marine-Hospital Service.



OPERATIONS

OF THE

UNITED STATES MARINE-HOSPITAL SERVICE.

1899.

CONTENTS.

	Page.
Report to the Secretary	13
Reorganization of the Marine-Hospital Bureau	13
Medical Corps:	
Boards convened to examine officers for promotion and applicants for admission to the Service	17
Promotions and appointments	17
Resignations	17
Casualty—	
Death of Asst. Surg. W. R. McAdam	17
Measures for the relief of families of deceased officers	18
Officers detailed to attend meetings of medical and public health associations	19
Report of Surg. P. H. Bailhache on Fiftieth Annual Meeting of the American Medical Association	19
Report of Surg. Charles E. Banks and P. A. Surg. J. J. Kinyoun on Meeting of National Pure Food and Drug Congress at Washington, D. C.	21
Report of Surg. Eugene Wasdin on International Conference for Prevention of Venereal Disease, Brussels, Belgium	22
Report of Surg. Joseph H. White on Convention of Health Officers at New Orleans, La.	26
Report of P. A. Surg. G. T. Vaughan on the International Tuberculosis Congress at Berlin, Germany	28
Aid to other branches of the Government service:	
Immigration Service	38
Tables of inspection	38
Life-Saving Service	39
Steamboat-Inspection Service	39
Revenue-Cutter Service	39
United States Coast Survey	39
Light-House Service	39
Naval Reserves	39
Army and Navy	39
Shelter for deck crews on Western rivers	40
Correspondence relative to	40
Legal schedule of provisions for seamen in the merchant marine of the United States	44
Marine hospitals and relief furnished:	
Summary of patients treated	46
Inspection of stations	46
Statement, by stations, of repairs made and needed	46
Marine hospital for the port of New York	56

Marine hospitals and relief furnished— Continued:	Page.
Contracts for care of seamen—Department circular	57
Establishment of a sanatorium for tuberculous patients	65
Correspondence exchanged in obtaining possession of the Fort Stanton Reservation	66
Administrative details—circular letters, etc.:	
Circular letter relative to treatment of tuberculous patients in separate wards	70
Replies to above circular letter	70
Instructions relative to diagnosis of smallpox	71
Letter directing vaccination of crews of all vessels so far as possible	72
Circular letter relative to marking hospital furniture	72
Circular letter relative to proper use of bedside tables	72
Circular letter directing copies made of correspondence between officers of the Marine-Hospital Service and local health officers and others	73
Relief of sick, disabled, or destitute seamen in Cuban ports	73
Amendment to Regulations, United States Marine-Hospital Service	74
Rules for examination of graduates of United States Naval Academy for admission to the United States Revenue-Cutter Service	75
Correspondence relative to forged masters' certificates	75
Report of purveying division:	
Removal of purveying division to New York City	77
Correspondence relative to	77
Additions and amendments to the Regulations, United States Marine-Hospital Service, 1897, for the management of the purveying depot at New York City	82
Financial statement	87
Reports of fatal cases, with necropsies	93
Contributed articles:	
Quarantine and commerce. By Surg. Gen. Walter Wyman	236
Quarantine and sanitation. By Surg. Gen. Walter Wyman	241
Marine-Hospital Service at Chicago. By Surg. H. W. Sawtelle	249
Soldiers treated in marine hospitals. By Surg. G. W. Stoner	254
English prototype of the Marine-Hospital Service and the development of a hospital service for seamen in the United States. By Surg. Charles E. Banks	266
New service ambulance. By Surg. Charles E. Banks	275
Lumbar puncture in treatment of cerebro-spinal fever. By P. A. Surg. T. B. Perry	279
Marine-Hospital sanatory ranch at Fort Stanton, N. Mex. By P. A. Surg. G. T. Vaughan	287
Notes on surgical clinics in Berlin, Paris, and London. By P. A. Surg. G. T. Vaughan	291
A case of arsenical poisoning. By P. A. Surg. W. J. S. Stewart	299
Gunshot wound. By P. A. Surg. J. H. Oakley	305
Report of the cruise of the U. S. S. <i>McCulloch</i> . By P. A. Surg. J. B. Greene	306
Statistics, United States Marine-Hospital Service	315

PUBLIC HEALTH SERVICE.

Division of sanitary reports and statistics:	
Public health reports	389
Cholera	390
Table	390

Division of sanitary reports and statistics—Continued:	Page.
Yellow fever	390
In the United States	390
Summer and fall of 1898	390
Summer and fall of 1899	390
Soldiers' Home, Hampton, Va.	390
Florida	391
Louisiana	391
Mississippi	391
Table—summer and fall, 1898	391
Table—summer and fall, 1899	392
In foreign places	393
Table	394
Plague	395
Table	396
Smallpox	397
In the United States	397
Table	398
In foreign places	406
Table	407
Cerebro-spinal meningitis	409
Circular letter relating to	409
Replies	410
Table—mortality by States	418
Epidemic dysentery in Japan	418
Table	419
Leprosy	419
Consular reports	420
Argentina (reported; no cases)	420
Brazil	420
Bahia	420
Pernambuco	421
Rio de Janeiro	422
Colombia	423
Ecuador	428
Guiana	430
British	430
Dutch	431
French	432
Paraguay	432
Uruguay (reported; no cases)	433
Venezuela	433
Table of cases reported October 1, 1898, to November 1, 1899	440
Investigation of leprosy in the United States under act of Congress	440
Bibliography of leprosy in the public health reports and annual reports, Marine-Hospital Service	441
Mortality statistics—cities of the United States, 1898	443
Division of insular and foreign quarantine and immigration:	
Cuba	468
Operations immediately following the close of the Spanish-American war	468
Executive orders	468
Details of quarantine officers	469
Report of P. A. Surg. M. J. Rosenau	473
Complete quarantine organization	474

Division of insular and foreign quarantine and immigration—Cont'd.	Page.
Cuba—Continued.	
Reports from United States quarantine stations	474
Habana	474
Matanzas and subports	483
Nuevitas and subports	488
Santiago and subports	490
Cienfuegos and subports	505
Vessels employed in the quarantine service in Cuba	510
List of	511
Porto Rico	512
Details of officers at San Juan and Ponce	512
Reports from United States quarantine stations	513
San Juan	513
Ponce	520
Mexico	521
Sanitary inspection service in Mexico	521
Detail of medical officer to Vera Cruz	521
Detail of Asst. Surg. L. E. Cofer to City of Mexico	524
Report of Assistant Surgeon Cofer on measures to prevent introduction of yellow fever from Mexico	525
Central America, fruit port-inspection service	530
Rules for government of vessels while at fruit ports	531
Acting assistant surgeons detailed to serve in the United States consulates	532
Instructions to fruit port inspectors	533
Reports of transactions at fruit ports	533
Puerto Cortez, Honduras	534
Port Limon, Costa Rica	537
Bocas del Toro, Colombia	538
Ceiba, Honduras	541
Livingston, Guatemala	545
Bluefields, Nicaragua	547
Belize, British Honduras	548
Brazil	549
Sanitary inspectors at Rio de Janeiro and Santos	549
Hawaii	549
Detail of Surg. D. A. Carmichael in office of United States consul at Honolulu	549
Reports from Surgeon Carmichael	549
Sanitary conditions in Honolulu. (<i>See</i> Public health reports, 1898.)	
Leprosy in the Hawaiian Islands. (<i>See</i> Public health reports, 1898.)	
Plague on steamships. (<i>See</i> Public health reports, 1899.)	
Report of transactions from October 2, 1898, to October 1, 1899.	550
Philippine Islands	553
Shipment of disinfecting apparatus to Manila	553
Inspection at Yokohama and Hongkong of army transports from Manila	555
Japan	557
Sanitary inspector at Yokohama	557
Report of transactions for the fiscal year	557

Division of insular and foreign quarantine and immigration—Cont'd.	Page.
China	566
Hongkong	566
Detail of medical officer in office of United States consul	566
Report of transactions	567
Turkey	570
United States sanitary commissioner at Constantinople	570
Egypt	571
Investigations of disinfection of rags at Alexandria and other ports	571
Italy	572
Quarantine and immigration inspection at Naples	572
Spain and Portugal	578
Inspection of Oporto, Portugal	578
United States consuls in Spain and Portugal directed to issue bills of health to vessels departing for Cuba and Porto Rico	580
Details of officers to United States consulates in Cadiz and Barcelona, Spain	581
Bremen, Hamburg, Antwerp, Rotterdam	582
Inspection of methods employed in the inspection of emigrants to the United States	582
Report of Eugene Wasdm, inspector	582
Consular bills of health	585
Irregularities in	585
United States army-transport service	586
Detail of Marine-Hospital Service officers during a period of nine months on army transports	586
Correspondence relating to transfer of medical-transport service to War Department	586
All Marine-Hospital officers off transports by May 15, 1899.	586
Reports on army-transport service by officers of the Marine-Hospital Service	588
Report by P. A. Surg. A. R. Thomas	588
Report by Asst. Surg. L. L. Lumsden	590
Report by Asst. Surg. L. D. Fricks	595
Report by Asst. Surg. John McMullen	596
Report by Asst. Surg. H. B. Parker	598
Report by A. A. Surg. Spencer Hough	600
Report by A. A. Surg. E. F. McConnell	602
Medical inspection of immigrants in Cuba and Porto Rico	605
Division of domestic quarantine—maritime and interstate, management of yellow-fever epidemics, smallpox, transactions at United States quarantine stations, etc.	606
Post epidemic disinfection	606
Report on, after epidemic of 1897, by Surg. H. R. Carter	607
Following the epidemic of 1898	613
Value of	618
Sanitary operations connected with the return of 30,000 troops from Cuba and Porto Rico	620
Montauk Point quarantine	622
Measures of other quarantine stations, particularly Savannah	625
Remains of deceased soldiers	643
Yellow fever at National Soldiers' Home, Hampton, Va.	643

	Page.
Division of domestic quarantine—Continued.	
Yellow fever in Louisiana and Mississippi	682
Yellow fever in Key West	694
Tortugas detention camp	710
Yellow fever in Miami	718
Camp McAdam	740
Yellow fever in Port Tampa City	743
Quarantine on the Texas-Mexican border	748
Florida coast patrol	748
Smallpox in the United States	755
Statistics in previous portion of report	755
General comments	755
Aid in suppression	756
Details of officers	756
Vaccination	757
Distribution of precis on the diagnosis and methods of suppression	772
Reports from the national quarantine stations	793
Reedy Island	793
Delaware Breakwater	794
Cape Charles	797
Cape Fear	798
Savannah	799
Transfer of station to United States	801
South Atlantic	807
Brunswick	810
Tortugas	812
Gulf	816
San Diego	817
San Francisco	819
Boarding of vessels	823
Columbia River quarantine	825
Port Townsend	827
Report on British Columbia quarantine—Williams Head	829
Amendments and additions to quarantine regulations	830
National quarantine law	833
Sanator—disinfecting steamer	833
Hygienic laboratory, report of	845
New building	860
Conclusion	862

ANNUAL REPORT
OF THE
SUPERVISING SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT TO THE SECRETARY.

TREASURY DEPARTMENT,
OFFICE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., November 1, 1899.

Hon. L. J. GAGE,
Secretary of the Treasury.

SIR: I have the honor to submit the following report of the Marine-Hospital Service of the United States for the fiscal year ended June 30, 1899, the same being the twenty-eighth annual report of the Service, and the one hundred and first year of its existence.

In addition to the information pertaining to the fiscal year 1899, the operations of the Service in regard to quarantine and public health matters are narrated to the present date.¹

REORGANIZATION OF THE BUREAU.

For some time past it has been evident that a reorganization of the Bureau was necessary in order to meet the demands made upon it by reason of the largely increased variety and volume of business.

As a necessary preliminary to the reorganization, the purveying depot was removed to New York City, as detailed elsewhere in this report.

The following order shows the operations of the Bureau as reorganized:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., September 28, 1899.

The following organization of the Bureau is adopted and will be in force from and including this date, subject to such changes as may be ordered from time to time by the Supervising Surgeon-General as experience demonstrates necessity therefor:

Walter Wyman, Supervising Surgeon-General.

A. J. McElhone, private secretary to the Supervising Surgeon-General.

Wm. P. Worcester, chief clerk.

¹ While preparing the report a few facts and statistics beyond November 1 have been necessarily inserted to complete the narration.

MARINE-HOSPITAL DIVISION.

Surg. Preston H. Bailhache in charge.
Mr. T. W. Stockard, bill, invoice and contract clerk.
Mrs. F. F. Meany, property return clerk.
Mr. E. J. Thurston, relief clerk.
Mr. W. F. Schlaar, assistant property return clerk.
Miss E. C. Brehaut, stenographer.

BUSINESS OF THE DIVISION.

Supervision of all matters pertaining to the Marine-Hospital Service proper; this includes all matters of relief in marine hospitals and at contract stations, the correspondence relating thereto, and the preparation of contracts therefor.

Supervision of special requisitions for medical and other supplies and transmission of the same to the medical purveyor; requisitions for vaccine for relief stations, requisitions for miscellaneous articles.

Supervision of the duties and correspondence of officers in their capacity as custodians of marine hospitals, including their correspondence with the supervising architect and will have charge of the expenditures under the appropriations, "Furniture, etc.;" "Fuel, lights, and water," and "Repairs and preservation of public buildings."

Supervising of advertisements for supplies, preparation of contracts, and supervision of emergency purchases.

Supervision of property returns at all relief stations and the purveying depot.

The officer in charge of this division will approve and refer to the chief clerk of the Department bills incurred under the appropriations, "Fuel, lights, and water," and "Furniture, etc."

This division will audit and deliver to the division of personnel and accounts, all bills incurred on account of relief stations, except pay rolls and traveling-expense vouchers, and will have supervision over the inspection of relief stations.

Preparation of such matter for the annual report as pertains to the marine-hospital business.

DOMESTIC QUARANTINE DIVISION.

Surg. J. H. White in charge.
Mr. G. A. Gustin, bill clerk, etc.
Miss D. E. Quin, property return clerk.
Mr. A. M. Wheeler, stenographer.

BUSINESS OF THE DIVISION.

Supervision over all matters pertaining to the national quarantine service in the United States. This includes advertising, proposals, contracts, emergency purchases, examination of property returns for quarantine stations, repairs to quarantine stations and vessels, and the conduct of quarantine stations.

Supervision and preparation for approval and reference to the marine-hospital division of requisitions for medicines and other supplies for quarantine stations.

Domestic epidemics; domestic and quarantine bills other than pay rolls and traveling-expense vouchers. Said bills after being audited to be delivered to the division of personnel and accounts.

Will furnish the officer in charge of the division of statistics and public-health reports with such reports as should be published, editing them before delivering.

Preparation of such matter for the annual report as pertains to the domestic quarantine division.

Requisitions for vaccine for epidemic and quarantine stations.

DIVISION OF PERSONNEL AND ACCOUNTS.

Surg. P. M. Carrington in charge.
Mr. H. P. Huddleson, personnel clerk.
Mr. J. W. Boyd, bill and account clerk.
Mr. E. G. Jefferys, bookkeeper.
Miss M. M. Leisen, stenographer.

BUSINESS OF THE DIVISION.

Supervision of matters relating to the personnel, appointments, promotions, transfers, discipline, etc.

Auditing of accounts for personal services and travel.

Bookkeeping and the final preparation for signature of all bills and accounts of whatever character; mailing of checks.

Sign references to the Secretary of the Treasury (appointment division) relating to routine changes in the personnel of hospital attendants, not involving increase in compensation or additional appointments.

Preparation and mailing of the weekly list of changes.

Preparation of the semiannual list of medical officers, etc., for publication.

Preparation of such matter for the annual report as pertains to the division of personnel and accounts.

DIVISION OF INSULAR AND FOREIGN QUARANTINE AND IMMIGRATION.

P. A. Surg. R. M. Woodward in charge.
Mr. F. L. Gibson, clerk.
Mr. A. M. Wheeler, stenographer.

BUSINESS OF THE DIVISION.

Supervising of foreign inspection service, including Cuba, Porto Rico, Hawaii, and the Philippines, and property returns relating thereto.

Medical inspection of immigrants.

Collective investigation of epidemic diseases in foreign countries, including new possessions, and any bills incurred on account of the above other than pay rolls and traveling-expense vouchers.

Auditing and certification of all telegraphic and cable bills.

Will furnish the officer in charge of the division of statistics and public-health reports with such reports as should be published, editing them before delivering.

Preparation of such matter for the annual report as pertains to the foreign quarantine division.

DIVISION OF STATISTICS AND PUBLIC HEALTH REPORTS.

P. A. Surg. G. T. Vaughan in charge.
Miss E. R. Jones, translator and assistant editor.
Miss L. E. Haupt, stenographer and statistician.

BUSINESS OF THE DIVISION.

Supervision over the public health reports, including the collection of information for publication; the preparation of copy; reading of proof; supervision of the mailing list, and the actual mailing of the reports.

Supervision of the publication of all mortality and other statistics; correspondence relating to these matters with public health officials.

Will confer with officers in charge of the domestic and foreign quarantine divisions relative to information to be published.

Preparation of such matter for the annual report as pertains to the division of statistics and public health reports.

MISCELLANEOUS DIVISION.

Asst. Surg. W. C. Billings in charge.

The officer in charge of this division will have supervision over necropsy reports, edit and otherwise prepare them for publication.

Examination of claims of keepers and surfmen of the Life-Saving Service for sick benefits, certify them, and return to the General Superintendent. Records for annual report.

Will have charge of the office copies of the medical journals, and classification of the various articles contained therein; also have editorial supervision over articles contributed by officers for publication in the annual report.

Will have supervision over the correspondence of officers detailed to make special scientific investigations, and will perform such other special duties as may be assigned to him from time to time by the Supervising Surgeon-General. Press clippings—Marine-Hospital Service, quarantine, and public health.

Annual report—Table of surgical operations; personal aid.

CHIEF CLERK'S OFFICE.

Wm. P. Worcester, chief clerk.

Miss A. J. Sorrells, assistant in chief clerk's room.

Mrs. E. H. Griffin, files clerk.

Miss A. L. Mallory, entry clerk.

Miss S. R. Beatty, copyist.

WALTER WYMAN,

Supervising Surgeon-General M. H. S.

Approved:

O. L. SPAULDING, *Acting Secretary.*

SEPTEMBER 1, 1899.

SIR: You are hereby placed in charge of the building occupied by this Bureau, and will make requisitions on the chief clerk of the Treasury Department for supplies, repairs, etc., as may be necessary. You will have charge of the business connected with the printing of the various publications of the Bureau; edit and forward to the stationery division all requisitions for stationery, books, and blanks for the various stations of the Service, and make requisitions for the stationery supplies and blanks required for the use of the Bureau.

It will also be your duty to receive the mail from the entry clerk and distribute it to the various divisions of the Bureau. In all these matters you will be under the direct supervision of the Surgeon-General and report to him direct.

Your attention is also called to sections 173 and 174 of the Revised Statutes of the United States, defining the duties of chief clerks, and you will govern yourself accordingly.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

MR. WM. P. WORCESTER,

Chief Clerk Marine-Hospital Service,

Washington, D. C.

MEDICAL CORPS.

At the end of the fiscal year 1899 the corps consisted of the Surgeon-General, 24 surgeons, 26 passed assistant surgeons, and 32 assistant surgeons—in all, 83 commissioned officers. At date of this report, November 1, this number has been increased to 90. Besides these

there are 95 acting assistant surgeons, 11 sanitary inspectors, and 38 hospital stewards—a total of 144 noncommissioned officers. The hospitals and quarantine stations require for their ordinary management about 400 attendants, but in times of epidemics this number is necessarily increased to a large extent.

BOARDS OF EXAMINATION.

Boards have been convened to determine the fitness of officers for promotion to higher grades, and five to examine the qualifications of applicants desiring to enter the Service as assistant surgeons. The last board convened—June 26—had not finished its work, and therefore had not made its report at the close of the fiscal year.

PROMOTIONS AND APPOINTMENTS DURING THE FISCAL YEAR.

Nine passed assistant surgeons have been promoted to the grade of surgeon, and 3 assistant surgeons promoted to the grade of passed assistant surgeons. Upon their own application, 86 physicians, desiring to enter the Service, were invited to appear before the various boards for examination as to their qualifications as prescribed by law. Sixteen were successful, and were commissioned assistant surgeons.

RESIGNATIONS.

One surgeon resigned his commission to date from May 31, 1899. One passed assistant surgeon resigned his commission to take effect August 9, 1899, and one assistant surgeon resigned to take effect October 3, 1898.

CASUALTY.

Since the close of the fiscal year the Service has lost one of the most promising of the younger officers, Dr. William Ralph McAdam, who died at his post of duty in Key West, Fla., on October 12, 1899.

CIRCULAR ANNOUNCING DEATH OF ASST. SURG. WILLIAM R. MCADAM, UNITED STATES MARINE-HOSPITAL SERVICE.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., October 20, 1899.

To the Medical Officers of the Marine-Hospital Service:

It is with deep regret that I announce to the officers of the Service the death of Asst. Surg. William R. McAdam, which occurred on the 12th instant at Key West, Fla., from yellow fever.

William Ralph McAdam was born in Mercer, Mercer County, Pa., February 23, 1870, son of the late William T. McAdam, post chaplain, United States Army. His early education was acquired in the public schools of Iowa, and under private tutors at frontier posts where his father was stationed. From 1886 to 1888 he attended the high school at Omaha, Nebr., and in the latter year entered the Iowa Wesleyan University at Mount Pleasant, Iowa, at which institution he completed the preparatory and collegiate course, receiving the degree of B. S. He began

the study of medicine in the summer of 1892, under Dr. C. T. Marsh, of Mount Pleasant, and entered Jefferson Medical College at Philadelphia, Pa., from which institution he received the degree of M. D. in 1897. After graduation he was appointed to the position of resident physician in the Wilkesbarre Hospital, where he served during the year ended July 1, 1898. He was commissioned an assistant surgeon in this Service August 3, 1898, and assigned to duty at Louisville, Ky., subsequently serving as assistant to the medical inspector of immigrants at the port of New York until February, 1899, when he was assigned to duty at Key West, Fla., where he was on duty until the time of his death, except for a short period spent at the Tortugas Quarantine Station.

During his service at Key West yellow fever made its appearance there, and the first notification of its existence was received from Dr. McAdam. He remained at his post of duty, rendering specially meritorious services in connection with the measures taken to prevent the spread of the disease from the island of Key West, and was himself attacked by it on October 6. The attack was at first considered a mild one and his recovery was confidently expected. Every precaution, however, was taken, and Surgeon Murray, who was en route to Miami, was diverted and ordered to proceed to Key West in order to attend him. The reports continued encouraging up to the 11th, and the news of his death on the morning of the 12th came as a surprise and shock to the Bureau.

Dr. McAdam was unmarried. As an officer he was intelligent, conscientious, and devoted to duty to a degree which won the respect and confidence of his superiors. As a man he was modest and of an exceptionally winning and lovable disposition, commanding the respect of all and having the affectionate regard of those officers with whom he was intimately associated.

WALTER WYMAN,
Surgeon-General M. H. S.

MEASURES FOR THE RELIEF OF THE FAMILIES OF DECEASED OFFICERS.

The death of Assistant Surgeon McAdam while engaged in the work of preventing the spread of epidemic disease again suggests the propriety of legislation in behalf of the families of all commissioned medical officers stricken by death at their post of duty. A partial precedent has been set by the act of Congress approved June 15, 1898, which granted to the legal representatives of Asst. Surg. John W. Branham the amount of his salary and allowances for two years, Dr. Branham having died of yellow fever. Another precedent exists in the act of Congress approved March 4, 1882, providing for payment of two years' salary to the families of members of the Life-Saving Service in the event of their death as a result of their peculiar calling. The same general legislation might with equal propriety be asked of Congress in behalf of the Marine-Hospital Service, since its officers are subject to change of station every four years by regulation and ordered to posts of exceptional danger either at home or abroad, and while thus engaged in labor for the public protection and welfare are debarred the opportunities of accumulation of property or wealth made possible by permanency of residence. They are not provided for as are two other branches of the Treasury Department, viz, the Life-Saving Service, as above mentioned, and the Revenue-Cutter Service, which, in times of war, is attached to the naval establish-

ment and participates in its privileges. During the past season three officers contracted yellow fever, one of whom died. In 1898 two, and in 1897 three, officers contracted the same disease. In the Annual Report of 1892 is a list of officers who to that date had contracted and died of contagious disease.

In view of the above facts and the military character of the work frequently devolving upon the Marine-Hospital Service, as set forth in the annual reports, I recommend that Congress be requested to grant relief as requested.

OFFICERS DETAILED TO REPRESENT THE UNITED STATES MARINE-HOSPITAL SERVICE AT MEETINGS OF MEDICAL AND PUBLIC HEALTH ASSOCIATIONS.

Since date of last report the following details have been made:

Surg. Charles E. Banks and P. A. Surg. J. J. Kinyoun to represent the Service at the meeting of the National Pure Food and Drug Congress, held at Washington, D. C., January 18 to 21, 1899.

Surg. J. H. White to represent the Service at a conference of health officers held at New Orleans, La., February 3, 1899.

P. A. Surg. G. T. Vaughan to represent the Treasury Department at the meeting of the International Tuberculosis Congress, held at Berlin, Germany, May 24 to 27, 1899.

Surg. Preston H. Bailhache to represent the Service at the meeting of the American Medical Association, held at Columbus, Ohio, June 6 to 9, 1899.

REPORT ON THE FIFTIETH ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

By Surg. PRESTON H. BAILHACHE.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., June 13, 1899.

SIR: In compliance with your letter of May 22, 1899, I represented the Marine-Hospital Service at the annual meeting of the American Medical Association, held at Columbus, Ohio, June 6-9, 1899, and have the honor to report as follows:

The association was called to order at 10 a. m., June 6, 1899, its president, Dr. J. M. Mathews, of Louisville, Ky., in the chair.

After addresses of welcome by the governor of the State and the mayor of the city, the president of the association delivered his annual address. Several points touched upon by him are of interest to the Service, "The prevention of the spread of tuberculosis" especially. He recommended the hospitalization of tuberculosis, and urged the appointment of a committee to prepare a report on the subject and present it to Congress, requesting the Government to erect or donate hospitals or reservations in which to care for the poor or others suffering with this disease, and also that the respective States erect similar institutions for this purpose. The recommendation of the president was subsequently presented in a resolution to the association and adopted unanimously.

Reference was made by the president to an international congress for the prevention of syphilis, which is to be held in Brussels, Belgium, in September next, stating that he had been requested by the honorable the Secretary of State to name

a delegation to attend the same, which he had already done. This recommendation was by resolution referred to said delegates.

The president also referred to the crusade against vaccination, thereby endangering the lives of the people, and asked that the association indorse by resolution the necessity of vaccination being made compulsory. A resolution to the above effect was subsequently presented to the association and adopted.

This being the fiftieth anniversary, the meeting of the association was very largely attended and much interest shown in the various sections, 13 in number. As it was impracticable to attend all these various sections, I contented myself with attending regularly the section on State medicine, which includes matters pertaining to the public health.

Much interest was evinced in this section on the question of the prevention of the spread of tuberculosis, and papers upon this subject were read by N. S. Davis, of Chicago; Surg. Gen. Walter Wyman, United States Marine-Hospital Service; Homer M. Thomas, of Chicago, and others.

The reports of committees presented to the general meeting were made from time to time, and the one of special interest to the Service—that on medical legislation—recommended by resolution the appointment of a special committee to consist of three members residing one in Washington, D. C., one in Philadelphia, and one in Baltimore, whose duty it shall be to represent the association before the committees of Congress and to invite, in the name of the association, the Army Medical Service, the Navy Medical Service, and the Marine-Hospital Service, and each State society of legally qualified practitioners of medicine to send one delegate each to a conference to be held in Washington, D. C., at such time as the committee shall determine, said conference to consider the medical and sanitary legislation now pending, and the members to report to the respective societies such action as in their judgment ought to be taken. This resolution was referred to the executive committee, which subsequently reported a resolution offered by the Philadelphia County Medical Society in regard to the organization of a national department of health with a cabinet minister at its head with the recommendation that the same be adopted, which was done, and the board of trustees was authorized to set aside the sum of \$500 in addition to that which had already been appropriated for the use of the special committee on the department of public health.

Resolutions were adopted appointing a committee of 25 to memorialize Congress with a view to enlarging the medical corps of the Army and Navy and increasing their efficiency. An amendment increasing the committee by the appointment of a delegate from each State and Territory where there are medical societies, and also one each from the Army, Navy, and Marine-Hospital Service, was accepted and carried:

“Resolved and recommended by the American Medical Association:

“1. That the Medical Corps of the Army and Navy be enlarged to meet properly all demands that may be made upon them.

“2. That transportation of medical supplies be under the control of the Medical Department.

“3. That a corps of sanitary inspectors be created, whose duty it shall be to examine into the sanitary condition of camps and bodies of troops in transit, and advise in relation thereto.

“4. That the Government establish permanent camp sites, the selection to be subject to the Surgeon-General, for use in the mobilization of large masses of troops.

“5. That a professor of military hygiene be appointed at West Point to instruct the cadets in the principles of sanitation.

“6. That the medical officers of the National Guard be subjected to rigid examination both for admission to the service and for promotion.

"7. That the Surgeons-General of the Army and Navy in time of peace and war be empowered to call into requisition the services of skilled specialists.

"8. That the President of the United States be respectfully urged to recommend to Congress the appointment of an army medical commission, to be composed of physicians and sanitarians to be taken from civil and military life, including the Surgeons-General of the Army and Navy, whose duty it shall be to prepare a report containing a detailed plan of a modern system to govern the medical departments of the Army and Navy in peace and war. Be it furthermore

"*Resolved*, That a committee be appointed by the president of the American Medical Association to wait upon and present these resolutions to the President of the United States for his favorable consideration."

The committee of the association on public health reported as follows:

"Your committee believes that there have been two prominent causes in the delay of the passage of a measure to create a national bureau of public health; one, the diversity of opinion existing in the profession as to the composition and details of such a measure, the other being the lack of information on the part of members of Congress concerning the importance of such legislation, and it is hoped that these two obstructions have largely been overcome and if the profession will stand firm in favor of it, the 'Spooner bill' will become a law during the next Congress. We recommend that \$500 be set aside for the use of your committee in addition to the \$200 already expended in appearing before committees of Congress."

This report was adopted by the association, although it seems to conflict with its previous action, which indorsed a department of health with a cabinet officer at its head instead of the proposed bureau of public health herein referred to. While the Spooner bill is inimical to the Marine-Hospital Service, it was not deemed necessary for the representative of the Service to oppose the action of the association in adopting this report, as it was believed that the provisions of the Spooner bill are entirely impracticable, and that Congress in its wisdom will recognize that fact.

In conclusion, I have to inform you that you were elected a member of the judiciary committee, as was also,

Yours, respectfully,

PRESTON H. BAILHACHE,
Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF SURG. C. E. BANKS AND P. A. SURG. J. J. KINYOUN, DELEGATES TO THE NATIONAL PURE FOOD AND DRUG CONGRESS.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., January 21, 1899.

SIR: In obedience to your orders of January 10, 1899, detailing the undersigned as delegates to represent this Service at the National Pure Food and Drug Congress held in this city January 18-21, 1899, we have the honor to report that, in compliance with your instructions, we attended the daily sessions of this congress, which was held in the lecture hall of the Columbian University of this city. This was the second annual session of this body, which is devoted to the purpose of securing general Congressional legislation to secure uniformity of standards in food products, the proper labeling of same, and the prevention of adulterations in foods and drugs.

The membership of this body is derived from various classes of organizations, State and national, such as State granges, boards of health, chambers of commerce and other trades unions, Farmers' Alliance, drug and chemical associations, manufacturers of various food products, candies, and liquors, and other similar bodies.

The object of the congress is a commendable one, and unquestionably the object

sought is in the interests of public health and for the general welfare of the people at large.

Two bills embodying their views have been introduced into the House and Senate, and are known, respectively, as the Brosius and Faulkner pure-food bills. The latter has been favorably reported to the Senate.

Aside from the business of the convention, which related to a consideration of ways and means for enlisting interest and public support for these measures, and to perfect the organization, addresses were delivered by various gentlemen of public prominence, including Hon. William E. Mason, Senator from Illinois, and Hon. Marriott Brosius, Representative from Pennsylvania.

The congress adjourned on the morning of January 21.

Respectfully, yours,

CHAS. E. BANKS,
Surgeon, M. H. S.
J. J. KINYOUN,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON PROCEEDINGS OF THE INTERNATIONAL CONFERENCE FOR THE PREVENTION OF VENEREAL DISEASE, HELD AT BRUSSELS, SEPTEMBER, 1899.

By Surg. EUGENE WARDIN.

PARIS, FRANCE, *September 15, 1899.*

SIR: I have the honor to report that in compliance with your order of the 21st ultimo to proceed to Brussels, Belgium, as a delegate representing the Service at the international conference for the prevention of syphilis and venereal disease, to convene in that city on the 4th instant, I attended the convention, which was opened in the Palais des Academies with an attendance of 110 representatives from the Governments and universities of many of the States of Europe, of South America, of India, and Japan.

The proceedings were inaugurated by the election of M. Léon de Bruyn, minister of agriculture for Belgium, as president, with Dr. Dubois Havenith, of Brussels, as secretary-general, and a corps of assistants.

After short addresses of welcome and responses on the part of France, Germany, and Russia, the president immediately announced the first question. Rarely have I witnessed such precision and celerity in the conduct of so large an assemblage, the spontaneous courtesy of our hosts being instantly met by a sympathetic appreciation.

France, Germany, and England were very well represented, the number of their delegates showing the importance which they attach to the question of the prevention of the spread of syphilis.

Japan also was well represented. The delegates from the United States were Dr. I. N. Bloom, of Kentucky; Dr. Lustgarten, of New York; Dr. Liston Montgomery, of Chicago, and myself.

By prearrangement the subject had been divided into six questions, as follows:

Question No. 1. Have the regulations at present in force had any influence upon the frequency and the propagation of syphilis and other venereal diseases?

Question No. 2. Is the present organization of medical surveillance of prostitutes capable of improvement?

Question No. 3. Looked at from a medical point of view exclusively, should the present system of licensed brothels be maintained or abolished?

Question No. 4. Can the police surveillance of prostitution be improved?

Question No. 5. By what legal measures is it possible to decrease the number of women seeking a livelihood by prostitution?

Question No. 6. Leaving prostitution out of the question, what measures should be taken to combat effectually the propagation of syphilis and the venereal diseases?

It was with genuine regret that the papers presented on these questions and the discussions of them were found to be largely a renewal of the ancient feud between the adherents to the practice of regulation and the advocates of the total abolition of all restrictive laws and practices for the regulation of prostitution. There was, indeed, very little that was new added to the preexisting fund of information. On one side of the chamber there were exhibited charts prepared by the veteran abolitionist, Nevins, of Liverpool, proving, as figures at times can, that during the period of reglementation syphilis and the venereal diseases increased in the British army and the larger cities of England, whereas since the repeal of the contagious diseases acts there has been a marked decrease of all these diseases.

On the other side there were hanging charts and columns of statistics showing the relative amount of syphilis and other venereal affections under the system of registration and medical surveillance which prevails in France and most European States and the marked decrease of all these infections.

After much discussion the sentiment of the conference was most aptly expressed that "there was no reliance to be placed upon statistics," because of the innumerable possibilities for error. It was, moreover, quite evident that the rules of regulation necessary, and of possible application under one form of government, would not be suited to another one recognizing more fully the personal rights of its citizens.

There was a general expression of the opinion that medical inspection as practiced was capable of much improvement, and that this should be in the direction of more accurate diagnosis. At the same time it was recognized that the difficulties in dealing with the question to-day are vastly greater than those which confronted sanitarians during the time when all venereal diseases were considered one and the same.

These difficulties are not only those of the diagnostician, but as well of the practical sanitarian, for scarcely can the same inflexibility be applied to the measures for the prevention of the spread of the gonococcus, pregnant as it is with destruction to the State in the loss of function in its women owing to this infection, as to that of the prevention of syphilis, which bears an increment of injury to the State unto the third and fourth generations.

To us who have never experienced an effort of our National Government to regulate prostitution, and thereby to diminish venereal diseases, there can be but a slight conception of the difficulties attendant upon the enforcement of such regulations and the possibilities for error in statistics deduced from the apparent results of such efforts, and this is made plain to us by the outcome of this conference, whose conception was an evidence of a demand for something more, some new plan for the accomplishment of this desirable end.

The unanimous conclusions of the conference are a confession of failure to do this, a failure so complete on the part of the regulationists that they are willing to forget past differences and start anew.

Shorn of its clouds of statistics and some animosities, the question finally came up in all its bareness. "Leaving prostitution out of the question, what measures should be taken to combat effectually the propagation of syphilis and venereal diseases?"—the last and vital question. Its discussion, I think, was not all that could have been desired in the interests of the millions of the future. Much was said of general moral improvement, of increased perfection in the treatment of these diseases, and, as in the case of Dr. Alfred Cooper, of London, the belief expressed that "no radical change could be expected unless the individuals who communicate and spread the disease are prevented from doing so, as far as possible." Only thus far and no further.

There was more than a hesitancy in pronouncing these diseases to be quarantinable ones, although they were characterized as the "most terrible" diseases. The fact remained that syphilis, the scourge of centuries, will continue, in spite of all our efforts, to spread and exercise its baneful influence until the general public is educated up to a moral plane sufficiently high to act as a natural barrier to its propagation; that this education must commence in the home and in the orphanages and be carried into the precincts of vice; that there should be one moral law for man and woman, and that the latter should be assisted above the conditions of want, conducive to prostitution, by the employment of women more freely by the State and otherwise, and the governments represented are asked to join themselves together in this crusade against the results of a vicious life.

Still the conference has made no recommendation as to the means that "should be taken" to suppress the disease pending the education of the public as to the dangers to health and life from these infections. No decision was reached as to the actual value of the regulation of vice. Regulation will no doubt still be continued throughout Europe. Have we need to adopt such a system? Could the system be successfully carried out among a people as intolerant of individual restraint as our own? Or, pending the education of the public, with an elevated morale, should there be considered even more stringent measures looking to the "stamping out" of the disease?

Without doubt every contagious disease is susceptible to total extermination by the methods of quarantine and disinfection. Our Government expends annually large sums in the interest of the public safety from infectious diseases, such as smallpox, while to this more fearful and equally contagious malady but little attention is paid.

No immigrant can enter our ports unless he gives satisfactory evidence of being free from the probability of introducing smallpox, yet the syphilitic may enter, so long as he does not promise to become a tax upon the nation within a given time.

In view of the conclusions of this conference it would seem the better plan to look upon the venereal diseases and syphilis as a menace to the public health, and to demand from all seeking admission to our shores, and from all entering our ports, who may be deemed capable of disseminating these diseases, an examination of such nature and sufficiently rigid to insure the detection of even latent stages of them: and then a detention adequate to protect the public health, or a return to their own countries. It can not be ventured that each case of gonorrhea or syphilis admitted will result in an expense to the State, but it is well known that these two diseases furnish a large percentage of admissions to the children's hospitals.

The importance of this question of preventing the propagation of these diseases is so great that the conference has resolved itself into a society of prophylaxis, "*sanitaire et morale*," believing it best to keep it before the sight of the nations, to the end that, at least from a union of sympathy, some measures may be devised through sanitary regulations and higher moral education to abate the results of the social evil.

Other than the ordinary courtesies of the congress, the delegates were shown a marked degree of hospitality, and were entertained by the president and secretary-general at their homes, and more formally by the minister of foreign affairs, and again by the Burgomaster and city council, the crowning distinction being the reception of the members by his Majesty Leopold II, who had a kind remark for each one expressed in a most gracious manner. The conference unanimously adopted the propositions inclosed herewith. The conference, as the society, will reunite in Brussels in 1902.

Respectfully,

EUGENE WASDIN,
Surgeon, M.-H. S.

SURGEON-GENERAL UNITED STATES MARINE-HOSPITAL SERVICE.

[Inclosure.]

AN INTERNATIONAL CONFERENCE FOR THE PREVENTION OF SYPHILIS AND VENEREAL DISEASES.

BRUSSELS, *September, 1899.*

VIEWS UNANIMOUSLY ADOPTED BY THE CONFERENCE.

I. Proposition of Messrs. Fournier and Lejeune.¹

The conference expresses a wish to see the governments employ all of their powers, having in view the absolute suppression of all prostitution of girls during their legal minority.

II. Proposition of Professor Fournier.

The conference expresses a desire to see the present meeting serve as an initial point in the foundation of a society of sanitary and moral prophylaxis, whose place of abode shall be at Brussels, and which shall display its activity—

(a) By the creation of a quarterly bulletin in which shall be published the reports and the interesting work of the said society.

(b) By a subsequent meeting of this congress.

The conference therefore decides that the next congress shall assemble at Brussels in 1902. It also names a provisional committee, which shall act as a permanent committee until the next congress, and to this end designates the following officers:

President: M. Lejeune, minister of state.

Vice-president: M. Beco, chargé of the administration of the sanitary service and public hygiene attached to the ministry of agriculture.

Secretary-general: Dr. Dubois-Havenith, secretary-general of the International Conference for the Prevention of Syphilis and professor-aggregate of the University of Brussels.

This permanent committee is charged to present to the next congress by-laws, as well as definite propositions for the organization of the society. It will take provisional measures from this time forth to assure the necessary ways and means for the transactions of the society and the publication of the quarterly bulletin.

The conference admits the necessity for the assessment of annual dues.

It decides that authors shall have the privilege of publishing, in French, English, or in German, their works, to which they are respectfully requested to add a very brief résumé. The translation of this résumé will be made into the two other languages by the secretary-general.

III. Proposition of Messrs. Fournier, Pavloff, Jonathan Hutchinson, Dutrelepont, Lesser, Petersen, De Sturmer, Neisser, Wolff, Mracek.²

¹ Mr. Alfred Fournier, professor of clinical syphilography of the faculty of medicine of Paris, member of the Academy of Medicine, physician of the St. Louis Hospital, delegate of the French Government.

Mr. Jules Lejeune, minister of state, senator, formerly minister of justice, delegate of the Belgian Government.

² Dr. Pavloff, college counselor, delegate of the Russian Government on behalf of the minister of public instruction.

Dr. Jonathan Hutchinson, delegate of the Government of Her Britannic Majesty (Royal College of Surgeons).

Professor Dutrelepont, professor of clinical medicine of the University of Berlin, delegate of the Government of the German Empire.

Professor Lesser, professor of clinical medicine of the University of Berlin, delegate of the Government of the German Empire.

Professor Petersen, professor of the Imperial Clinical Institute of the Grand Duchess Helene Pavlovna, St. Petersburg.

Dr. De Sturmer, counselor of state, delegate of the Russian Government, St. Petersburg.

Dr. Neisser, professor of clinical dermatology of the University of Breslau.

Professor Wolff, professor of syphilogic dermatology of the University of Strasbourg.

Professor Mracek, professor of clinical syphilography of the University of Vienna.

The conference, believing that a deep knowledge of venereology constitutes one of the best measures to efficaciously combat the propagation of venereal diseases, recommends to all Governments to at once provide competent physicians in every institution; and in every university complete and obligatory courses whose subjects shall form a part in the programmes of official state examinations.

It respectfully requests that these examiners should be specialists.

IV. Proposition of Dr. C. de Sturmer:¹

(a) It is important that orphans should be better protected. To this end the choice of teachers should be guided not only by the previous occupation of the applicant, in order to conserve the material interests of the children submitted to their care, but also, and above all, by the necessity of assuring the morality of these teachers.

(b) Whoever has charge of the education of youth should accord every solicitude to the moral development of his pupils. He should strenuously endeavor to teach them temperance and respect for woman, whatever may be her social condition.

V. Proposition of Dr. Commenge,² amended by Dr. Fournier.

The conference recommends every possible severity of law against procuresses and keepers of brothels.

VI. Proposition of the British Medical Association, presented by Dr. Saundby.³

The conference asks the Governments to provide in each country a commission charged:

1. To determine the frequency of venereal diseases among the civil population, and to make from time to time an abstract of their greater or less prevalence.

2. To make an inquiry into all institutions at present existing for the treatment of venereal infections; of their distribution in hospitals; of the number of beds at their disposal in various localities, and to propose more efficacious measures for the treatment of these diseases.

3. To collect the various opinions relative to the best means for preventing and eradicating the dissemination of venereal diseases among the civil population and to give their definite conclusions on this subject.

VII. Proposition of Professor Lesser, of Berlin.

The Governments are requested to take every favorable opportunity to draw the attention of the public, and above all of young people, to the danger which prostitution presents to the health of persons of both sexes and to the sad consequences of venereal diseases.

VIII. Proposition of Messrs. Pierson and Fiaux.⁴

The conference expresses a desire to see the statistics of venereal diseases of all countries arranged upon a uniform basis.

REPORT OF SURG. J. H. WHITE UPON THE CONVENTION OF HEALTH OFFICERS HELD
IN NEW ORLEANS, LA., FEBRUARY 9, 1899.

UNITED STATES IMMIGRATION SERVICE,
MEDICAL DIVISION, BARGE OFFICE,

New York, February 21, 1899.

SIR: I have the honor to submit the following report with regard to the convention of health officers assembled at New Orleans, La., on February 9, and attended

¹ Reproducing the view adopted by the congress of Russian physicians in 1897.

² Dr. Commenge, honor physician in general of the dispensary of health of the prefecture of police of Paris.

³ Dr. Saundby, professor of medicine, president of the council of the British Medical Association, Birmingham.

⁴ M. Pierson, president of the International Abolitionist Federation.

Dr. Fiaux, vice-president of the French Branch of the International Abolitionist Federation.

by me as representative of the service, in pursuance of your order of February 3, 1899:

The meeting being called to order by Temporary Chairman Dr. Edmond Souchon at 10 a. m., on February 9, proceeded to election of officers, as follows: Dr. J. W. Scott, of Houston, Tex., president; Dr. G. F. Patton, of New Orleans, La., secretary, and Mr. Robert Landry clerk.

Dr. Souchon then introduced three resolutions bearing on the question of quarantining first cases of yellow fever.

These resolutions practically stated that for first cases the town should not, if these cases are properly guarded and isolated, be quarantined. They were referred to a committee consisting of Dr. J. F. Y. Paine, chairman, and Drs. D. F. Stuart, R. F. Morris, R. L. Randolph, Rhett Goode, Alfred Duperier, and Mr. August Keller. This committee reported back a substitute, consisting of one resolution, reading as follows:

"No locality shall be quarantined on cases of contagious diseases reported as suspicious, doubtful, or disputed, provided the cases are properly isolated, the premises disinfected, the inmates and suspects thoroughly disinfected, and both inmates and suspects kept under proper observation by the local health authorities, all under the supervision and control of the State board of health, State health officer, or United States Marine-Hospital Service; and such suspected case or cases shall be reported to the health officers or boards of health of adjacent States, and they shall be invited to send representatives to view said case or cases. This resolution also applies to sanitariums, hospitals, and barracks."

The substitute was criticised and in some measure condemned. After some little argument on both sides, pro and con, I stated to the convention that it was right and proper to accept the substitute, provided it were slightly amended, so as to read that quarantine should not apply in case original foci were safely guarded, be it only suspicious or be it genuine yellow fever. I held that the substitute covered ground entirely omitted in the originals—to wit, the agreement to report all cases of either class, and that neighboring communities had a right to see and investigate the precautions taken and to judge for themselves whether those precautions were of such a character as to justify nonquarantine and whether the danger was such as might later call for quarantine; all this in order that they might, even though not quarantining now, be ready when the time did come to meet any emergency arising.

This proposition meeting with favor, Dr. Souchon offered the needed amendment and the resolution passed by almost unanimous vote as below:

"No locality shall be quarantined on cases of contagious diseases reported as suspicious, doubtful, or disputed; provided, the cases are properly isolated, the premises disinfected, the inmates and suspects thoroughly disinfected, and both inmates and suspects kept under proper observation by the local health authorities, all under the supervision and control of the State board of health, State health officer, or United States Marine Hospital Service; and such suspected case or cases shall be reported to the health officers or boards of health of adjacent States, and they shall be invited to send representatives to view said case or cases. This resolution also applies to sanitariums, hospitals, and barracks, the same to apply to first case or cases of genuine or positive yellow fever."

The secretary then read the proposed amendments to the Atlanta agreement of April, 1898, and it was agreed that the chair appoint a special committee to consider the same.

The chair then named the special committee to report upon the proposed revision of the Atlanta regulations, announcing Dr. J. H. White, Marine Hospital, chairman, by priority of selection; Dr. Joseph Kohn, New Orleans; Dr. R. H. Harrison, Texas; A. S. Benn, Mobile; Dr. Edmond Souchon, New Orleans; I. W. Ashner, New Orleans; Dr. W. M. Brumby, Houston; E. E. England, Mobile;

W. F. Owen, New Orleans; L. H. Fairchild, Bay St. Louis and Waveland; George H. Lord, New Orleans.

The committee agreed to report at 4 p. m., and the convention adjourned until then. The findings of the committee as submitted to the full convention were practically the same as the proposed amendments, which amendments were largely written by Surg. H. R. Carter, of this Service, in conference with Dr. Edmond Souchon, president Louisiana State Board of Health.

At 4 p. m. the convention again came to order, and the chairman of special committee reported that the committee concurred in the proposed amendments with only slight alterations, and these mainly in the interest of clearer meaning, the elision of ambiguity, etc.

The report of the committee inclosed herewith was published in the New Orleans Times-Democrat February 10, 1899.¹

The foregoing covers as completely as possible the ground taken by the convention.

The one object sought by your representative was the obtaining of a formal agreement by the Louisiana State and the New Orleans City boards of health to report first cases, be they either suspicious or positive.

This, as may be seen, was fully attained. The remaining resolutions are, I believe, in full accord with the regulations of the United States Marine-Hospital Service, and in many cases they parallel the quarantine regulations framed by the board convened in Washington one year ago.

Very respectfully, yours,

J. H. WHITE,
Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON THE GERMAN CONGRESS FOR COMBATING TUBERCULOSIS AS A PEOPLE'S DISEASE, HELD IN BERLIN MAY 24-27, 1899.

By P. A. Surg. GEORGE T. VAUGHAN, United States delegate representing the Treasury Department and Marine-Hospital Service.

This congress, inaugurated under the patronage of the Empress Frederick, was essentially German, though foreign countries were invited to take part in the proceedings. President, the Duke of Ratisbon, and secretary-general, Dr. Pannwitz. The sittings were held in the assembly room of the Reichstag building.

There were about 2,000 members of the congress, the large majority coming from the various parts of the German Empire, but many foreign countries, as the United States, England, France, Russia, Austria, Italy, Spain, Denmark, and Egypt, were represented.

The official delegates of the United States were Surg. J. C. Boyd, representing the Medical Department of the Navy; Dr. C. W. Stiles, the Medical Department of the Army; Dr. George H. Nuttall, the American Public Health Association; Dr. E. A. de Schweinitz, the Agricultural Department, and P. A. Surg. George Tully Vaughan, the Marine-Hospital Service and Treasury Department. The American Medical Association was represented by Drs. Colmar and Banker, of Indianapolis.

The opening of the congress was an informal social assembly of the members on the evening of the 23d. The next day, the 24th, the congress was officially opened at 11 a. m. in the assembly room of the Reichstag building in the presence of the Empress.

After speeches by the German officials, the foreign countries were called in alphabetical order and a short opening speech was made by a member from each delegation. Dr. J. C. Boyd, United States Navy, spoke for America (United States);

¹ Omitted.

Prof. Grainger Stewart, for England; Professor Brouardel, for France; Professor Maragliano, for Italy; Professor Kusy, for Austria; Professor Koranyi, for Hungary, and Professor Bertenson, for Russia.

After the preliminary speeches the work of the congress was begun by the reading of a paper entitled "General consideration of the spread and significance of tuberculosis as a people's disease," by Doctor Köhler, director of the Kaiserlichen Gesundheitsamtes. He stated in substance that statistics are unreliable—especially of cases and in childhood. Statistics of deaths are more reliable. However, enough material is on hand to warrant us in saying that the greatest loss of human life and health year by year is due to tuberculosis. Of the countries generally, the conditions most favorable to the spread of lung tuberculosis were found in Great Britain, Belgium, and Italy, and conditions least favorable in Austria, Hungary and Russia. The German Empire shows a mortality from tuberculosis of 2.25 per thousand and from other diseases of the respiratory organs of 4.9 per thousand, while the total mortality from all diseases was 21.8 per thousand—more than 10 per cent of the total number of deaths being from tuberculosis. Elevation above the sea level does not seem of overwhelming importance. Comparison fails to show much advantage in the forests of Germany. Men have a greater mortality from lung tuberculosis than women. The fight is by no means hopeless and some sanatoria have notably decreased the mortality.

The exercises continued with two sessions daily except on Friday, when no session was held in the afternoon. There was usually an entertainment at night. On Saturday afternoon the meeting adjourned sine die. There were more than one hundred papers on the programme and the most of them were read.

Abstracts of the papers were published daily in the *Tageblatt*.

The subject under consideration was discussed under the following headings:

(A) The spread of tuberculosis; (B) the etiology of tuberculosis; (C) the prophylaxis of tuberculosis; (D) the therapy of tuberculosis; (E) sanatoria for tuberculosis.

On each of these headings there were four or five "leaders of discussion," and to these unlimited time was granted for the reading of their papers, and they usually took from twenty minutes to forty minutes, and then the "discussion" began by the reading of papers limited to ten minutes, and continued till all the papers were read or it was time to adjourn.

A few of these abstracts, rendered in English by the translator of the Bureau, are appended. The complete articles will appear in the volume of transactions of the congress when published.

(A) DIVISION.—SPREAD OF TUBERCULOSIS.

CONNECTION BETWEEN THE EXTERNAL RELATIONS OF LIFE AND THE SPREAD OF TUBERCULOSIS.

[By Dr. Krieger, of Strassburg.]

The external relations of life may influence the spread of tuberculosis either by supplying the conditions for infection or rendering the body locally or generally receptive to the cause of disease.

These influences are extraordinarily numerous and are closely connected with each other. In order to study a special influence it is necessary to isolate it from concurring influences. This is a difficult task.

Among the studies of unfavorable influences which have so far failed to give any definite result may be reckoned statistics as to the frequency of tuberculosis in city and country, among the poor and the prosperous, etc. Statistics as to the effect of certain occupations in cases of deaths of tuberculosis are of more value.

The difficulty in isolating the injurious influences is found in the fact that the

significance of certain important hygienic factors, such as food and the arrangement of houses, is not yet sufficiently demonstrated.

On the ground of bacteriological and medical observation it may be accepted as proved that association in close rooms with tuberculous persons who eject bacillary secreta is highly conducive to the spread of the disease. The treatment of the sputa, the arrangement of the house, and the method of cleaning it here play the most important rôle.

In investigating climatic influences we are met by the difficulty that the influences concurring with those of climate are not sufficiently known. The season of the year has a great effect on mortality from tuberculosis, but as regards its effect on the spread of tuberculosis the facts are not apparent.

Occupations exercise a great influence on the spread of tuberculosis. Among these may be noted:

1. Occupations or injuries which cause catarrh, stoppage of the fine bronchial tubes, thereby creating local receptivity (overloading of lung with dust or injury by corrosive vapor).

2. Occupations which require during work a posture in which only a part of the lungs is used in breathing and in which blood and air circulation is impeded, thereby giving rise to local receptivity.

3. Occupations in which continual sitting causes diminished muscular activity and a weakening of the entire organism, especially of the heart, thereby causing a general loss of resistance throughout the body.

SPREAD OF TUBERCULOSIS AMONG INSURED COMMUNITIES.

[By Von Gerhardt.]

1. Measures for combating the spread of tuberculosis are most effective when they are applied to those communities which are most injuriously affected by the disease.

2. The spread of tuberculosis in communities which have put themselves under protection, from a social point of view, of the system of insurance far exceeds the average prevalence of tuberculosis in the population generally.

3. It is of the greatest importance, from a politico-social point of view, to establish institutions for the cure of tuberculosis and also to provide means of protection for those communities which can not afford to institute such measures. Tuberculosis is in very many localities the cause of the unproductiveness of societies for insurance against sickness and old age. These societies or companies are greatly injured by the spread of tuberculosis, and in their interest, as well as the interest of the insured, means should be taken to check the growth of this disease.

TUBERCULOSIS IN THE ARMY.

[By Generaloberarzt Doctor Schjerning.]

The measures taken in the German army to prevent or diminish tuberculosis are based on Koch's discovery, and on the scientific and practical studies which have grown out of that discovery. They are confined to the care of the food supplied the army and to an oversight of the physical condition of the men.

From 1882 to 1892 the number of cases maintained at first an average, then rose in consequence of the epidemic of influenza, and finally declined in spite of the increase of the numerical strength of the army. During the past year the number has reached the lowest point, a fact in favor of the means employed to check the disease.

The frequency of the appearance of tuberculosis in an army is a measure of the method and value of the recruiting service.

The lowest number of tuberculous cases is found in the corps recruited from

provinces which are more or less exempt from the disease. The highest number is found in the tenth, third, sixteenth, sixth, eleventh, and fourteenth army corps, and in general corresponds with the prevalence of the disease in the civil population from which the corps were recruited.

The vicinity of cities influences tuberculosis in the army. The mortality fell from 0.63 per cent in 1882-83 to 0.24 per cent in 1897-98. This is an evidence that the disease was early recognized, and that the tuberculous men were discharged out of consideration for the general health of the army.

The men who were engaged in barrack work, bakers, musicians, and those generally who work in confined spaces show the highest number of tuberculous cases. The men belonging to the active corps—infantry, cavalry, artillery, and pioneer—show the larger sick list, but the smaller number of cases of tuberculosis.

Most cases occur in the first year of service. Men who have passed twenty-two years have most tendency to the disease. The twentieth year of age appears to be the best time for entering the army in order to avoid tuberculosis. Twenty-nine per cent of the sick have tuberculous complications.

Half of all those who show tuberculosis have suffered previously with symptoms which later developed into tuberculosis, and it is evident that the disease was latent. This shows how important it is for the military physician to have a knowledge of the personal history of a delicate recruit or one suspected of tuberculosis.

TUBERCULOSIS AMONG DOMESTIC ANIMALS AND ITS RELATION TO THE SPREAD OF TUBERCULOSIS AMONG MEN.

[By Professor Doctor Ballinger, of Munich.]

1. Tuberculosis of pigs and cattle is identical in its origin with human tuberculosis. This fact is not only of importance in cattle raising, but is a serious menace to the health of mankind.

2. Human tuberculosis as the source of animal tuberculosis plays a subordinate part.

3. The infectiousness of the flesh of tuberculous animals depends on the stage and grade of the disease. There is no doubt some danger in it to human health, but the danger is not very great, and it can be avoided by careful preparation of the meat and by avoiding the eating of raw or half-cooked meat.

4. A greater danger lies in milk and in sterilized-milk products. The milk possesses not only generalized and pure tuberculosis, but frequently also local tuberculosis.

5. The milk of tuberculous cows is especially injurious to children and receptive persons of weak constitution.

6. The best proof of the danger from tuberculous milk is found in the prevalence of hog tuberculosis, when these animals have been fed on tuberculous milk.

7. The great spread of tuberculosis among children is evidence of infection by milk.

8. The first step for protection of life from animal tuberculosis is the enforcement of the laws regarding inspection of meat and milk.

SPREAD OF TUBERCULOSIS AMONG WORKMEN IN TOBACCO FACTORIES.

[By Dr. Brauer, of Heidelberg.]

From clinical and statistical data it appears that workmen in tobacco factories suffer to a relatively high degree from tuberculosis.

The manufacture of tobacco and the crowding in tobacco factories supply the conditions for tuberculosis. Since most of the tuberculous persons engaged in this trade spit on the ground, the bacillus may be breathed in with the dust.

In a large number of tuberculous cases among tobacco-factory hands the source

of the disease is found outside of the factory in the unsanitary lodgings and sleeping rooms of this class of workmen.

Whether the individual succumbs to or resists the injurious influences of the tobacco factory depends largely on heredity.

(B.) DIVISION OF ETIOLOGY.

THE TUBERCLE BACILLUS IN ITS RELATION TO TUBERCULOSIS.

[By Professor Flügge, of Breslau.]

The tubercle bacillus is the only direct cause of the several varieties of tuberculosis of the lungs, larynx, joints, glands, intestines, miliary tuberculosis, and lupus.

Tuberculosis in mammals—namely, the so-called “pearl disease” in cattle—is due to the same parasite. The identity of aviar tuberculosis with human tuberculosis has not yet been demonstrated. The tubercle bacilli are obligate parasites. They develop apart from artificial culture, as far as our experience goes, only in the human and animal organism.

In the external world they exist practically only in sputum and the milk and flesh of tuberculous animals.

WAYS AND MEANS OF CONVEYANCE.

[By Prof. C. Fränkel, of Halle.]

Every man and even every animal in whose excretory organs tubercle bacilli find lodgment forms a source of infection.

Outside of the human and animal organism the bacilli generally falls to the ground. Here it does not increase, and by degrees it succumbs to the influence of light and dryness. We are liable to encounter it only in the vicinity of the patient.

The infectious power of the bacillus is less than that of many other diseases, and it is also further restricted by the limited receptivity of the human subject. As a rule, conveyance of the disease takes place only as the result of repeated and abundant reception of the tubercle bacillus and close and continuous intercourse with the patient. Tuberculosis generally spreads only within the family or among men who live, sleep, and work in close, ill cleaned, and ill lighted rooms.

The absorption of the tubercle bacillus by men can take place by the skin and mucous membrane, through the alimentary canal by means of milk, butter, tuberculous meat, or through the lungs. The latter way of conveyance is by far the most common, and the modus is inhalation of damp, fresh sputum, or sputum dried on floors, handkerchiefs, etc.

MIXED INFECTION.

[By Professor Pfeiffer, of Berlin.]

Tuberculosis, especially lung tuberculosis, does not long remain uncomplicated. Generally other exciting causes of disease (streptococci, etc.) are associated with the tubercle bacillus. There results from such a mixed infection the clinical “consumption.” The so-called hectic fever of consumption is especially due to this infection.

Persons affected with mixed infection are a danger to one suffering from uncomplicated lung tuberculosis. This person should therefore be promptly recognized and isolated.

The therapeutic measures adopted against lung tuberculosis are also greatly influenced by the conditions of mixed infection.

HEREDITY, IMMUNITY, AND DISPOSITION.

[By Professor Löffler, of Greifswald.]

1. Tuberculosis may heal spontaneously. Natural immunity inherited or acquired has not so far been demonstrated.

2. Inherited tuberculosis occurs so seldom that heredity counts for nothing in practice.

3. No certain basis has yet been found for the theory of inherited disposition to tuberculosis.

4. On the other hand, it is very probable that other diseases of the respiratory and digestive processes may favor tuberculous infection.

A NEW PROCESS OF CULTIVATING THE TUBERCLE BACILLUS.

[By Dr. W. Hesse.]

The new process consists mainly in the use of an agar-agar nutritive medium, which instead of the usual addition of pepton contains Heydan nutriment. Heydan nutriment is fluidified soluble albumen, which in its characteristics occupies a place between coagulated albumen and somatose. In this medium the tubercle bacilli increase two or three times as quickly as in the best solid medium hitherto known. This fact possesses many advantages, especially for the culture of the tubercle bacillus in sputum.

THE FIRST STAGE OF CONSUMPTION.

[By Prof. Birsch Hirschfeld, of Breslau.]

The generally accepted theory that primary consumption results as a rule from a caseous inflammation, with a tendency to form foci (tuberculous broncho-pneumonia), has not in 1 case out of 32 cases of latent primary tuberculosis, examined from sections taken from injured persons or persons who have died suddenly, received any confirmation. On the other hand, the results in 4 cases were in favor of the theory that the disease began with the formation of lumps in the tissue of the lung (miliary tuberculosis). In 28 cases it was definitely shown that tuberculosis has its first site in the mucous membrane of a medium-sized bronchus.

Primary broncho-tuberculosis is in the majority of cases localized in the under part of a lung apex (generally the right), and in a lesser number of cases in the parietal lobe which belongs to the "bronchus apiculatus" posterior division. This branch of the bronchial system corresponds with the respiratory process in the several parts of the chest cavity, and exhibits also in adults certain unfavorable conditions which impede the removal of mechanical obstructions of the respiratory process.

The morbid disposition growing out of these conditions is necessarily increased by the impaired development of the bronchial branches, to which is to be attributed the unfavorable conditions so often occurring at the time of the greatest lung growth, namely, at the age of puberty.

ON THE SIGNIFICANCE OF HYPERPLASIA OF THE TONSILS.

[By Dr. Brieger, of Breslau.]

Hyperplasia of the tonsils is wrongly considered a partial symptom of scrofula. It should be considered as the typical symptom. Tuberculosis may, however, conceal itself under the appearance of hyperplasia of the tonsils. It may constitute the first and undoubted manifestation of tuberculosis, but is usually combined with localizations of the disease. Latent tuberculosis of the tonsils generally signifies tuberculosis of the neighboring organs, middle ear, or lymph glands, but apart from the possibility of communication by the lymph process possesses only subordinate significance as regards general tuberculosis.

TRAUMATISM AND TUBERCULOSIS.

[By Messrs. Lannelongue and Achord, of Paris.]

Since the celebrated experiments of Max Schüller on the development of the tuberculous process as the result of articular contusions it has been admitted that

traumatism may localize on the point affected, an infection created at a distance from the point affected, or else generalized. In the human clinic we seldom see a severe fracture or luxation become in tuberculous persons the point of departure of a bacillary focus. There would therefore seem to be in the case of this disease, and contrary to what is known of other diseases, discrepancy between experimentation and clinics.

The experiments made by Schüller were in part directed to human cultures, more or less pure, and in part cultures of microbes wrongly considered as agents of tuberculosis, the true micro-organism of which is still unknown.

We have inoculated guinea pigs by different processes (cellular tissue, peritoneum, trachea, blood) with cultures of the human bacillus or tuberculous products, and have subjected these animals to contusions and fractures at different periods of infection. They died tuberculous, but without presenting a tuberculous lesion on a level with the wound.

We have repeated these experiments on rabbits, injecting them with pure cultures of the human bacillus with the same results. As the cultures are only slightly virulent for these animals we inoculated them with products of human origin and repeatedly obtained tuberculous arthritis, but on condition of inoculating strong doses in the blood and producing traumatism simultaneously with inoculation.

The impurity of the products inoculated may facilitate production of localized lesions. Still, the conditions in which we obtained experimentally the localization of the tubercular process by means of traumatism are very different from those realized in human clinics, so that the discrepancy pointed out above is only apparent.

In short, it is not as easy, as is believed on the evidence of Schüller's experiments, to localize in a traumatic focus the processus tuberculous. This fact is readily explained by the rarity of blood infection among tuberculous animals and by the rapidity with which the injected bacilli disappear in the blood.

SERO-DIAGNOSIS OF TUBERCULOSIS—AGGLUTINATION OF HOMOGENEOUS CULTURES OF THE TUBERCLE BACILLUS BY THE HUMORS OF MEN AND ANIMALS.

[By Arloing and J. Courmont, of Lyons.]

To obtain the agglutination of Koch's bacillus it is necessary first to obtain homogeneous liquid cultures. This may be accomplished by daily shaking of the cultures. Cultures eight or twelve days old are employed.

Experiments have been made with human serum in 186 cases. Of these cases 106 were clinical tuberculosis. All gave the agglutinating reaction except in 10 cases of febrile and cavity tuberculosis. The more benign and diffused the tuberculosis the more manifest the agglutination, and the more severe the tuberculosis the less is the reaction, precisely as in the case of tuberculine. Of 60 nontuberculous subjects only 34 gave a negative result, 26 agglutinated, making 43 per cent of persons apparently healthy who had tuberculous larvæ. About the same figures are given by Beck for tuberculine.

Forty-five serous effusions gave us positive results.

In brief, the study of agglutination gives excellent results in diagnosing tuberculosis, especially in the latent larval state. It must be admitted that the reaction may fail in advanced cases, but in these cases diagnosis is always easy.

The only difficulty is the necessity to maintain homogeneous cultures always in a state to agglutinate. It is also necessary to be habituated to the process, which admits of only a very restricted scale—one-fifth to one-twentieth. The process has a future before it.

ON HUMAN TUBERCULOSIS DUE TO BACILLI OTHER THAN THE BACILLI OF KOCH.

[By J. Courmont, of Lyons.]

Reference is here made to two cases of human tuberculosis anatomo-pathologically typical and yet not presenting Koch's bacillus, but due to a special

bacillus very similar to but not identical with that of the pseudo-tuberculosis of the guinea pig.

The first case was that of a young woman who died of granulations. The second, that of a young man who died of tuberculosis complicated with Pott's disease, the characteristics being tuberculous cysts and caseous ganglions. The lesions contained the giant cells but no Koch's bacilli.

Inoculated in the guinea pig these lesions occasioned in from five to eight days a typical tuberculosis impossible to differentiate from Koch's tuberculosis, but due to specific bacillus. The microbe grows rapidly and does not discolor by the Erlich or Gram process. It is a streptococcus bacillus, closely resembling that of the guinea pig, but a comparative study of these two microbes has shown that they are not similar. The human streptococcus does not grow in carrots or artichokes or in milk, while that of the guinea pig grows abundantly in all these media.

(C.) DIVISION OF PROPHYLAXIS.

PROPHYLAXIS OF TUBERCULOSIS IN HOSPITALS.

[By Professor von Leube, of Würzburg.]

1. The spread of tuberculosis in hospitals is preventable by prophylactic measures, the application of which is attended with no special difficulty.

2. These prophylactic measures consist mainly—

(a) In the strict observance of the rule that the patients shall deposit their sputum in cups, the bottom of which is covered with a fluid, in order to prevent the drying and pulverization of the sputum.

(b) In the use of wads of batting held before the mouth during coughing to prevent sprinkling with sputum drops.

3. To guard against the soiling of the floor, bed, and clothing with sputum, which may occur in spite of observance of these rules, the bed and bedclothing must be frequently changed and the floor swept with a wet broom, and the bed and bedclothing of dead consumptives must be disinfected. While making the bed and sweeping the floor the attendants must wear a muslin mask over the nose and mouth.

4. To prevent infection by inhalation and contact the patient must be washed daily, and the physicians and attendants when they have to come in close relations with the patient must previously wash their hands in a carbolic solution, or one similar to it.

5. Absolute separation of tuberculous patients from others in a hospital is not necessary if these rules are strictly carried out.

The phthisis ward should be the best lighted and ventilated of the hospital. If possible a pavilion should be erected in the grounds of the hospital where the tuberculosis patients may recline on couches and have the benefit of the outdoor light and air.

PROPHYLAXIS OF TUBERCULOSIS IN RELATION TO FOOD.

[By Professor Virchow, of Berlin.]

1. *Beef*.—The existing laws and ordinances governing slaughterhouses are sufficient when thoroughly carried out. It is, however, desirable that imported meat and meat from private slaughterhouses should be subject to law. The importation of live animals from abroad should be allowed only when the tuberculin test removes suspicion.

2. *Milk*.—Milch cows, goats, etc., should be subjected to the tuberculin test. The sale of raw milk should be prohibited in case the test was positive or had not been applied.

3. *Hog flesh*.—The frequent presence of tuberculosis in the lymph glands and

walls of the neck makes examination of hog flesh and the application of strict measures as regards its sale of the highest importance.

4. *Fowls*.—The tuberculosis of fowls has not yet been proved identical with tuberculosis of men and the higher animals. It is, however, recommended that tuberculous fowls be killed.

ALCOHOL AND TUBERCULOSIS.

[By Dr. A. Baer, of Berlin.]

The abuse of alcohol has a direct influence on the development of tuberculosis by weakening the functions of the individual organs and lowering the resistance of the body, thus predisposing it to absorb and develop the tubercle bacilli.

The struggle against tuberculosis must be fought on prophylactic grounds, and it demands improvement in the conditions of life of the laboring classes. The diminution of drunkenness is a necessity, since it is the most active cause of disease among the people.

Alcohol should be used in hospitals only as a remedy and never as a stimulant.

INVESTIGATION OF THE RELATION OF COMMERCIAL CHOPPED MEAT TO THE TUBERCLE BACILLUS.

[By Oberstabsarzt Dr. Schumberg, of Hanover.]

Many investigations have been made to ascertain if the flesh of locally tuberculous animals contains the tubercle bacillus, viz, by Nocard, Galtier, Bang, Hagemann, Kastner, Perroncito, Ostertag. The results were sometimes positive, sometimes negative. Positive results were obtained when the tuberculosis was extensive and pus-cavity formations were present. Ostertag declared the muscular system to be immune against tuberculosis. Nevertheless he does not favor the unconditional use of tuberculous flesh, since the lymph glands, lymph vessels, and joints of such flesh may be infected. He does not object to the use of flesh of locally infected animals when there is no infection of the glands.

These investigations have more or less scientific but a very secondary practical interest. Their scientific value lies in the question whether in commercial meat, which is generally eaten raw or nearly raw, the tubercle bacillus is or is not present. The meat might become infected with tubercular material on the shelves of the meat shops. This question is as important as the study of infection of dairy products.

PROTECTION AGAINST DANGER OF INFECTION IN SANITARIUMS AND HEALTH RESORTS.

[By Director von Weismayr.]

It is typical of the public mind to be afraid of sanitariums, while health resorts are sought even by the well without fear. It has, however, been demonstrated that sanitariums bring no danger to a locality. As regards health resorts it has been shown that they often occasion infection.

Thorough instruction in regard to the conveyance of tuberculosis by sputum and milk is necessary to the suppression of tuberculosis.

At health resorts, as at sanitariums, expectoration should be strictly prohibited. Sputum dishes should be supplied at all hotels and park pavilions and on public walks. In order to provide against the sprinkling with bacilli, which has been proved by Flügge to take place, these vessels should be breast-high and filled with water. For private use pocket flasks are to be recommended. In private houses the sputum should be emptied into the closet. The sputum ejected in public should be collected in an open space, covered with earth, and burned, or thrown with quicklime into a narrow, cemented hole.

So long as the inoculation of cows with tuberculin is not obligatory the public must be instructed to avoid the use of uncooked milk.

(D.) DIVISION OF THERAPY.

CURABILITY OF TUBERCULOSIS.

[By Von H. Curschmann, of Leipzig.]

The cure of lung tuberculosis is to be studied anatomically and histologically in the conditions present in the rare outcome of the disease.

Arrest of the process with more or less extended cicatrization, and also often obliteration of the lesions of the bronchial tube and consequently elimination of the cause of the disease, is frequently observed on the dissecting table.

In a clinical sense a considerable proportion of these cases can be set down to cure, a greater number to relative cure, or, in other words, the arrest of the process by improved conditions of health. Accurate statistics in regard to such cures or partial cures are, however, not obtainable.

The best results are at present to be ascribed to dietetic physiological treatment, aided by judicious medical care.

The possibility of directly reaching the pathogenic microbe, and through it the process which it sets up, rests to-day on very slight evidence. It may be recognized as only the basis of future experimentation.

The cure of tuberculosis rests on individual conditions.

An early diagnosis is of the very first necessity. Special attention should be given to the latent form of the disease. Even double and well-defined tuberculosis may ultimately arrive at a stage of relative cure—a fact which all have observed.

Special climatic conditions have not the virtue once ascribed to them. Apart from the extremes of climate, it may be said that fresh, pure air, not subject to great variation, provides the only essential to cure from a climatic point of view. The former instructions in the choice of an "immune zone" would not now be accepted.

Favorable external conditions must receive attention. As regards age, the chances of recovery are relatively better in middle or old age, since here the acute forms of the disease and the conversion of the process into military tuberculosis are not as frequent as in children or young persons.

Sex has no connection with the process of cure except in conjunction with child-bearing.

As regards heredity, the transmission of physical conditions has more to do with the development of the disease than direct transmission of tuberculous lesions.

(E.) DIVISION OF SANITARIUMS.

SANITARIUMS FOR CHEST DISEASES IN SWITZERLAND.

[By Dr. Schmid.]

At the present time there are 7 public sanitariums, containing 376 beds, in Switzerland, which were founded between 1874 and 1878.

	Beds.
The Berne Sanitarium.....	110
Basle Sanitarium.....	96
Zurich Sanitarium.....	90
Glarner Sanitarium.....	28
Malvilliers Sanitarium.....	22
Asylum for women in Feydey (Waadt).....	15
Asylum for men in Leysin (Waadt).....	15

Large capitalization for the founding of other public sanitariums has been made in the cantons of St. Gall, Aargau, Solothurn, Waadt, Thurgau, and Graubünden.

SEASIDE SANITARIUMS FOR CHILDREN.

[By Dr. Erwald.]

The child sanitariums on the German seacoast supply the most effective prophylaxis in cases of disposition to tuberculosis in young people.

They show complete cures of incipient tuberculosis of the inner organs, especially the respiratory organs and the glands.

The results are equally good in summer and in winter and are in proportion to the length of stay at the sanitarium.

It is therefore extremely desirable that the period of cure, which is now six weeks, should be increased, and, if possible, be unlimited. Especially should the winter cure be more practiced.

An increased number of seaside sanitariums for children is much to be recommended. There should be a two-years' stay.

AID TO OTHER BRANCHES OF THE GOVERNMENT SERVICE.

AID TO THE UNITED STATES IMMIGRATION SERVICE.

The following table shows the ports at which immigrants were inspected and the number examined at each port during the year.

Ports.	Males.	Females.	Total.
Baltimore, Md	9,763	4,889	14,652
Boston, Mass	9,582	9,645	19,227
Galveston, Tex	503	399	902
Key West, Fla	1,946	583	2,529
Miami, Fla	8	0	8
New Bedford, Mass	24	30	54
New Orleans, La	1,264	453	1,717
New York, N. Y	151,198	91,375	242,573
Philadelphia, Pa	5,894	4,077	9,971
Portland, Me	322	90	412
Portland, Oreg	961	21	982
Newport News, Va	3	2	5
San Francisco, Cal	3,726	1,040	4,766
Gloucester, Mass	1	1	2
Tampa, Fla	51	11	62
Total	185,246	112,616	297,862

Number of immigrants debarred at the ports of the United States during the year ended June 30, 1899.

Idiots	1
Insane persons	19
Paupers or persons likely to become public charges	2,594
Loathsome or dangerous contagious diseases	345
Convicts	4
Assisted immigrants	82
Contract laborers	647
Returned in one year after landing	263

The following form has been prescribed upon which monthly reports of medical inspection of immigrants are now rendered:

REPORT OF INSPECTION OF IMMIGRANTS.

Report of immigrants inspected at the port of ———, ———, during the month of ———.

Total number of immigrants inspected, ———.

Number passed, ———.

Number certified for deportation on account of dangerous contagious or loathsome diseases or for other physical causes, ———.

Disposition of immigrants certified for deportation.

Number of cases pending at beginning of month. ———.
 Number of immigrants certified for deportation during month, ———.
 Total number to be accounted for. ———.
 Number deported, ———.
 Number admitted, ———.
 Number cases pending at close of month. ———.

Conditions which required certificates for deportation.

Disease or condition.	No. of cases.	Disease or condition.	No. of cases.

 Surgeon, U. S. M. H. S.

AID TO THE LIFE-SAVING SERVICE.

During the year 1,271 physical examinations of keepers, surfmen, and applicants for the position of surfman were made. Of this number 1,197 men were passed and 74 were rejected. Three hundred and sixty-three claims of surfmen for benefits provided by section 7 of the act of May 4, 1882, have been passed upon in the office of the Surgeon-General.

AID TO THE STEAMBOAT-INSPECTION SERVICE.

There were examined 1,860 applicants for pilots' license, of which number 64 were rejected.

AID TO THE REVENUE-CUTTER SERVICE.

Nine hundred and ninety physical examinations were made; 879 of the men were found physically fit for duty and 111 were rejected.

AID TO THE UNITED STATES COAST AND GEODETIC SURVEY.

Thirty-six physical examinations were made with no rejections.

AID TO THE LIGHT-HOUSE SERVICE.

Fourteen applicants were examined as to their physical fitness and one rejected.

AID TO THE NAVAL RESERVES.

Eight physical examinations were made for this service and none rejected.

The total number of physical examinations made during the year (exclusive of immigrants) was 4,179; rejections, 250.

AID TO THE ARMY AND NAVY.

Under the provisions of Department circular of May 2, 1898, approved by the President, approximately 1,000 patients of the Army

and Navy were received and cared for in the United States marine hospitals during the fiscal year.

SHELTER FOR DECK CREWS ON WESTERN RIVERS.

In the annual reports of this service for 1873, 1874, 1876, 1877, 1882, 1895, 1897, and 1898, a great deal of evidence has been collected showing the brutal and unnecessary exposure imposed upon the deck crews of Western river boats during the winter season. In 1897, on my recommendation, Congress included in "An act amending the laws relating to navigation" a section intended to remedy this evil, and the Supervising Inspector-General issued a circular in enforcement of the law. As the circular gives the terms of the law it is again published:

[Circular.]

TO PROVIDE SLEEPING ROOM FOR CREWS OF STEAMERS PLYING THE MISSISSIPPI RIVER AND TRIBUTARIES.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING INSPECTOR-GENERAL,
Washington, D. C., June 21, 1898.

To Masters and Owners of Western River Steamers, and

Inspectors of Steam Vessels on the Mississippi River and Tributaries:

Your attention is called to the following extract from section 2 of the act of Congress approved March 3, 1897:

"AN ACT to amend the laws relating to navigation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

* * * * *

SEC. 2. That * * * on and after June thirtieth, eighteen hundred and ninety-eight, every steamboat of the United States plying upon the Mississippi River or its tributaries shall furnish an appropriate place for the crew, which shall conform to the requirements of this section, so far as they shall be applicable thereto by providing sleeping room in the engine room of the steamboats properly protected from the cold, winds, and rain by means of suitable awnings or screens on either side of the guards or sides and forward, reaching from the boiler deck to the lower or main deck, under the direction and approval of the Supervising Inspector-General of Steam Vessels, and shall be properly heated.

Any failure to comply with this section shall subject the owner or owners to a penalty of five hundred dollars.

* * * * *

Approved March 3, 1897."

Local inspectors of steam vessels will, on and after July 1, 1898, require the master, owner, or agent of all steamers navigating on the waters named in the act above quoted to be furnished for the protection of the crews thereof "with suitable awnings or screens on either side of the guards or sides and forward, reaching from the boiler deck to the lower or main deck;" *Provided, however,* That steam vessels whose engine rooms are closed in by permanent joiner works, sides and bulkheads, such steamers will be deemed to be in compliance with law, without further equipment for the protection of their crews, other than the necessary sleeping accommodations.

Such screens or awnings must be so arranged by fastening to the upper and lower decks sufficiently close as to shut out rain, or snow, or drafts of wind, and must extend along the sides, and also athwartships the vessel.

The inclosed place required for crew may be located between the forward and after end of boiler deck, where most practicable and convenient to accomplish the object sought in the act herein quoted.

Inspectors of steam vessels will promptly report to this office the refusal or neglect on the part of the master, owner, or agent of any steam vessel in their local district to comply with this law, and the regulations herein provided for, and shall also report such offense to the collector of customs, who will impose the penalty prescribed by law and forward to the Secretary of the Treasury any application that may be made for the remission of such penalty as provided in article 973 of the Regulations of 1892.

JAS. A. DUMONT,
Supervising Inspector-General.

Approved.

O. L. SPAULDING,
Acting Secretary.

The phraseology of this law is not as originally recommended, and whether the law and the circular issued in accordance therewith are sufficient to bring about the necessary relief is a matter upon which the Bureau is now seeking information. The following correspondence is of interest and has a bearing upon this subject, which will continue to engage the attention of this Bureau until the disgraceful treatment of the deck hands shall be prohibited.

CORRESPONDENCE RELATING TO SHELTER FOR CREWS OF STEAMBOATS ON THE
OHIO RIVER.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
Louisville, Ky., December 14, 1898.

SIR: I have the honor to state that the amendment of navigation regulations in effect from June 30, 1898 (Department circular No. 58, of April 1, 1897), requiring vessels to provide proper sleeping places for crews, is not obeyed and its provisions not carried out by the boats plying upon this and other rivers, so far as I can learn.

I have, therefore, to request information as to whose duty it is to see to the enforcement of the law. I have been informed that the inspectors of hulls are the proper persons, and if such be the case I would respectfully request that their attention and that of their superiors be called to the violation (passive) of the law.

The roustabouts on river boats have no remedy unless this Service espouses their cause.

The temperature in this locality has been as low as 12° on several days, and this morning was at 4°, probably the setting in of a severe winter, and without the prescribed protection for crews of river steamers the cases of disease due to exposure stand excellent chance of rapid development.

Very respectfully, yours,

W. P. MCINTOSH,
Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE HOSPITAL SERVICE.

OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., December 19, 1898.

SIR: Referring to your letter of the 14th instant, relative to the law requiring provision to be made for the shelter of deck crews on river steamers, you are informed that the attention of the Supervising Inspector-General of Steam Vessels

has already been called to this matter, and the Bureau is informed that he will issue the necessary instructions to the local inspectors of steam vessels. I have, however, forwarded a copy of your letter to him.

By direction of Supervising Surgeon-General, Marine Hospital Service.

Respectfully, yours,

PRESTON H. BAILHACHE,
Surgeon, M. H. S.

MEDICAL OFFICER IN COMMAND,

United States Marine-Hospital Service, Louisville, Ky.

OFFICE OF THE SUPERVISING INSPECTOR-GENERAL,
Washington, D. C., December 20, 1898.

SIR: I am in receipt of a letter from your office (Preston H. Bailhache) inclosing a communication from P. A. Surg. W. P. McIntosh, Louisville, Ky., charging in general terms that the law "requiring vessels to provide proper sleeping places for crews is not obeyed," and requesting "information as to whose duty it is to see to the enforcement of the law."

In reply to the request of Assistant Surgeon McIntosh, last quoted, would say that he will find full information in the circular 58 of April 1, 1897, referred to by him in the first paragraph of his letter.

I would further say that if Assistant Surgeon McIntosh will make his general charge specific as to name of vessel or vessels, and wherein such vessel or vessels fail to comply with the requirements of the law and the regulations of the Department, as set forth in circular No. 58, 1897, this office will take steps to investigate such charge.

Respectfully, yours,

JAS. A. DUMONT,
Supervising Inspector-General.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,

Washington, D. C.

[Indorsement.]

Washington, D. C., December 22, 1899.

Respectfully referred to P. A. Surg. W. P. McIntosh, Louisville, Ky., for his information. This paper to be returned.

By direction of the Supervising Surgeon-General:

PRESTON H. BAILHACHE,
Surgeon, M. H. S.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
Louisville, Ky., December 30, 1898.

SIR: Referring to my letter of the 14th instant in regard to sleeping arrangements for deck crews on river steamers, and to indorsement on letter of the 20th instant (inclosed herewith) of the Supervising Inspector-General of the Steamboat Inspection Service, asking for specific statements, I have the honor to state that I have this day in company with another gentleman (who had the entree to all parts of boats), inspected the following steamboats and made inquiries of the men themselves regarding the sleeping accommodations of the deck hands, with results stated opposite each vessel's name:

The *Falls City*, a new boat, has absolutely no accommodations for deck hands. Being a new boat, there is no reason why sleeping places should not have been supplied before she left the shipyards.

The steamer *Tarascon* is in the same condition as the *Falls City*: no sleeping places for deck crew provided.

The *Sunshine*, a White Collar Line packet from Cincinnati to Memphis, has no place for deck hands to sleep.

Inquiries of deck hands on all these boats elicited the reply that they slept under the engine, on the floor, or any place they could.

The *City of Louisville*, a Cincinnati and Louisville packet, is the only one among the steamboats visited that has complied with the law, and she has very comfortable sleeping places for the men.

The following boats, I am informed by intelligent men now in hospital who have recently worked on them, have no accommodations for deck hands: *Big Kanawha*, *Wm. J. Cummings*, *State of Kansas*, *H. D. Hudson*, *Buckeye State*, and the *Boston*.

The medical officer at Evansville, Ind., writes me that from inquiries made among patients in that hospital he finds that very few, if any, of the boats running to that place have any accommodations for sleeping.

Very respectfully, yours,

W. P. McINTOSH,

Passed Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,

Washington, D. C.

OFFICE OF THE SUPERVISING INSPECTOR-GENERAL,

Washington, D. C., January 5, 1899.

SIR: The copy of letter from Passed Assistant Surgeon McIntosh, referred by you to this office on the 4th instant, has this day been received, and a copy of the same has been forwarded to the supervising inspector, sixth district, for investigation and report.

Respectfully, yours,

JAS. A. DUMONT,

Supervising Inspector-General.

P. H. BAILHACHE,

Surgeon, Marine-Hospital Service, Washington, D. C.

TREASURY DEPARTMENT,

OFFICE OF THE SUPERVISING INSPECTOR, SIXTH DISTRICT,

Louisville, Ky., January 9, 1899.

SIR: Referring to the copy of letter addressed to the Supervising Surgeon-General, United States Marine-Hospital Service, from W. P. McIntosh, passed assistant surgeon, United States Marine-Hospital Service, in regard to sleeping arrangements for the deck crew on river steamers, I would respectfully state: I visited the steamer *Falls City* (new boat mentioned) when she was at this port and questioned the deck crew in regard to their sleeping quarters. They replied, "Our quarters are warm, but we sleep on the floor."

The facts are, many steamers that come to this port have no compartment or space to be used exclusively for sleeping quarters for the deck crew: neither are they provided with bunks or bedding.

However, their engine rooms are inclosed, thereby protecting the men from cold, wind, and rain. They are also provided with a stove for the use of said crew, who use this room for sleeping quarters.

In reference to the statement of the medical officer at Evansville, Ind., the local inspectors at that port recently reported that the steamers under their jurisdiction

had complied with the requirements contained in circular letter dated June 16, 1898, by providing suitable quarters for the crew.

Very respectfully,

E. L. DORSEY,

Supervising Inspector, Sixth District.

Hon. JAMES A. DUMONT,

Supervising Inspector-General.

The foregoing letter was referred to Passed Assistant Surgeon McIntosh January 17, 1899, for his information and report. In returning the letter Dr. McIntosh states that "the facts in the case are exactly as stated in former report and as published in one of the Louisville daily papers."

LEGAL SCHEDULE OF PROVISIONS FOR SEAMEN IN THE MERCHANT MARINE OF THE UNITED STATES.

On March 12, 1896, the chairman of the Committee on the Merchant Marine and Fisheries forwarded to the Secretary of the Treasury a letter, inclosing schedules of provisions for seamen, in bills then pending, and requested that they be referred to the Surgeon-General of the Marine-Hospital Service for his opinion and suggestions for their amendment. A board was accordingly convened to prepare a proper schedule or scale of provisions to be allowed and served out to crews of merchant vessels during the voyage. On March 21, 1896, the board submitted its report, which is published in the annual report of 1896. Legislative action was not completed until December 21, 1898, the date of approval of the act of Congress entitled "An act to amend the laws relating to American seamen and to promote commerce." The sections of this act relating to provisions are herewith published, and it will be seen that the table of rations provided varies but slightly from the table recommended by the Service. The changes are as follows: One-half pound of fresh bread is added to the daily ration and one pound of salt pork to the weekly ration. Canned meat is substituted for preserved meat and the weekly allowance increased one-half pound. Beans are increased from one-fourth to one-third pint. Fish is reduced one pound per week. Pepper, mustard, and salt are changed from a small prescribed amount to "sufficient for seasoning." Furthermore, section 23 of the act requires that "fresh fruit and vegetables shall be served while in port if obtainable. The seamen shall have the option of accepting the fare the master may provide, but the right at any time to demand the foregoing scale of provisions." The act further requires that "the foregoing scale of provisions shall be inserted in every article of agreement and shall not be reduced by any contract, except as above, and a copy of the same shall be posted in a conspicuous place in the galley and in the forecabin of each vessel," and provides for a survey by three persons, one of whom, if possible, shall be a medical officer of the Marine-Hospital Service, to pass upon the provisions furnished, when complaint is made, as provided for by the act.

Following are the sections of the act referred to:

AN ACT to amend the laws relating to American seamen, for the protection of such seamen, and to promote commerce.

SEC. 23. That section forty-six hundred and twelve of the Revised Statutes is hereby amended by striking out the scale of provisions and substitutes in Table A, and in place thereof inserting the following scale of provisions and substitutes to be allowed and served out to the crew during the voyage:

	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Water.....	quarts.	4	4	4	4	4	4
Biscuit.....	pound.	4	4	4	4	4	4
Beef, salt.....	pounds.	1	1	1	1	1	1
Pork, salt.....	pound.	1	1	1	1	1	1
Flour.....	do.	1	1	1	1	1	1
Canned meat.....	do.	1	1	1	1	1	1
Fresh bread.....	pounds.	1	1	1	1	1	1
Fish, dry, preserved, or fresh.....	pound.	1	1	1	1	1	1
Potatoes or yams.....	do.	1	1	1	1	1	1
Canned tomatoes.....	do.	1	1	1	1	1	1
Pease.....	pint.	1	1	1	1	1	1
Beans.....	do.	1	1	1	1	1	1
Rice.....	do.	1	1	1	1	1	1
Coffee (green berry).....	ounce.	1	1	1	1	1	1
Tea.....	do.	1	1	1	1	1	1
Sugar.....	ounces.	3	3	3	3	3	3
Molasses.....	pint.	3	3	3	3	3	3
Dried fruit.....	ounces.	3	3	3	3	3	3
Pickles.....	pint.	1	1	1	1	1	1
Vinegar.....	do.	1	1	1	1	1	1
Corn meal.....	ounces.	4	4	4	4	4	4
Onions.....	do.	4	4	4	4	4	4
Lard.....	ounce.	1	1	1	1	1	1
Butter.....	do.	1	1	1	1	1	1
Mustard, pepper, and salt sufficient for seasoning.....							

“SUBSTITUTES.

“One pound of flour daily may be substituted for the daily ration of biscuit or fresh bread; two ounces of desiccated vegetables for one pound of potatoes or yams; six ounces of hominy, oatmeal, or cracked wheat, or two ounces of tapioca, for six ounces of rice; six ounces of canned vegetables for one-half pound of canned tomatoes; one-eighth of an ounce of tea for three-fourths of an ounce of coffee; three-fourths of an ounce of coffee for one-eighth of an ounce of tea; six ounces of canned fruit for three ounces of dried fruit; one-half ounce of lime juice for the daily ration of vinegar; four ounces of oatmeal or cracked wheat for one-half pint of corn meal; two ounces of pickled onions for four ounces of fresh onions.

“When the vessel is in port and it is possible to obtain the same, one and one-half pounds of fresh meat shall be substituted for the daily rations of salt and canned meat; one-half pound of green cabbage for one ration of canned tomatoes; one-half pound of fresh fruit for one ration of dried fruit. Fresh fruit and vegetables shall be served while in port if obtainable. The seamen shall have the option of accepting the fare the master may provide, but the right at any time to demand the foregoing scale of provisions.

“The foregoing scale of provisions shall be inserted in every article of agreement, and shall not be reduced by any contract, except as above, and a copy of the same shall be posted in a conspicuous place in the galley and in the forecabin of each vessel.”

SEC. 8. That section forty-five hundred and fifty-seven of the Revised Statutes be, and hereby is, amended to read as follows:

“SEC. 4557. The judge, or justice, in a domestic port, shall upon such application of the master or commander, issue his precept, directed to three persons in the neighborhood, the most experienced and skillful in maritime affairs that can be procured; and whenever such complaint is about the provisions one of such surveyors shall be a physician or a surgeon of the Marine-Hospital Service, if such service is established at the place where the complaint is made. It shall be the

duty of such surveyors to repair on board such vessel and to examine the same in respect to the defects and insufficiencies complained of, and make reports to the judge, or justice, as the case may be, in writing, under their hands or the hands of two of them, whether in any or in what respect the vessel is unfit to proceed on the intended voyage, and what addition of men, provisions, or stores, or what repairs or alterations in the body, tackle, or apparel will be necessary; and upon such report the judge or justice shall adjudge and shall indorse on his report his judgment whether the vessel is fit to proceed on the intended voyage, and, if not, whether such repairs can be made or deficiencies supplied where the vessel then lies, or whether it is necessary for her to proceed to the nearest or most convenient place where such supplies can be made or deficiencies supplied; and the master and the crew shall, in all things, conform to the judgment. The master or commander shall, in the first instance, pay all the costs of such review, report, or judgment, to be taxed and allowed on a fair copy thereof, certified by the judge or justice. But if the complaint of the crew shall appear upon the report and judgment to have been without foundation, the master or commander, or the owner or consignee of such vessel, shall deduct the amount thereof, and of reasonable damages for the detention, to be ascertained by the judge or justice, out of the wages of the complaining seamen."

MARINE HOSPITALS AND RELIEF FURNISHED.

The total number of patients treated by this Service during the fiscal year ended June 30, 1899, was 55,489, of which number 12,583 were treated in the hospitals of the Service and at contract stations. The remainder, 42,906, were treated as out-patients. These are the largest totals of any year in the history of the Service.

INSPECTIONS OF STATIONS OF THE SERVICE.

Inspections of marine-hospital stations of the first, second, third, and fourth classes have been made from time to time and reports received upon the blank forms provided therefor and described in the report for 1898.

STATEMENT BY STATIONS OF REPAIRS MADE AND NEEDED.

The following is a statement of repairs and alterations made during the fiscal year, and of repairs and alterations still needed at the several marine hospitals:

Hospital at Baltimore, Md. (erected 1887).—Surg. George Purviance makes the following report of repairs and improvements at this hospital station:

A new cement walk has been placed on the east and south side of disinfecting building, water-closets have been repaired and are in good condition, new carpets for officers' quarters in executive building have been provided. A concrete and brick floor has been put in the boiler and engine room, surgeon's house repainted, and woodwork of wards and porches repaired. Disinfecting chamber has been placed in the new disinfecting building and is in good condition. The microscopical laboratory has received a number of improvements, and the X-ray apparatus has been placed in this room.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Repairs to building, \$100; repairs to range, \$25; total, \$125.

Hospital at Boston, Mass. (erected 1860).—Surg. Fairfax Irwin makes the following report of repairs and improvements at this hospital station :

Hospital electric call bell system repaired	\$50.00
Purchased 600 feet fire hose, 6 fire extinguishers, and 2 fire ladders	223.00
Concrete floor laid in the laundry ironing room	260.00
New top and grates furnished for hospital range	21.00
New tile floor placed in operating room, including certain necessary alterations to plumbing	774.30
New quartered-oak floor placed in dispensary and a new iron stairway constructed leading to medical storeroom in basement beneath dispensary	533.00
Materials for construction of linen closet on third floor	32.00
Miscellaneous repairs to plumbing, including the replacing of 3 wash-bowls, 2 water-closets, and connecting same	126.80
Two new doors to replace worn and rotted ones	14.70
Miscellaneous purchases of locks, hinges, washers, and wax	51.10
Taking out old indirects and replacing same with radiators, repairs to 3 boilers and line of heating pipes	599.00
Repairs to cable wheel of elevator	8.95
New tube scraper and packing for boilers	8.85
Ward for the reception of officers as patients has been furnished	144.49
Ward and hospital furniture added	1,712.09
Drying frames and ironing tables in laundry renewed and repaired	115.00
Hospital carriage repaired	149.00
Dispensary fitted up with new cases, counter, etc	674.33
Furnished camera and photographic outfit	151.92
Total	5,649.53

The following work and repairs have been done by the engineer and other hospital attendants, viz:

Placed 50 feet of brass steam pipe, made new top to cistern, made new window frames and placed new glass in all the windows to area-way in basement, repainted cupola and railing around same, repaired and reshingled tomb in cemetery, placed in two new doors, repaired ice chest, painted baseboard and placed gas pipe in officers' ward, placed in 45 feet of brass water pipe, placed additional shelves in medical storeroom, placed shelves in laboratory, fitted up a temporary dark room for photographic work, placed gas pipe in steward's dining room and laboratory, removed obstruction in laundry drain, painted five iron bedsteads, constructed linen closet on third floor, repaired fence around reservation, whitewashed basement throughout, planted certain flowers and shrubbery on lawn, and performed numerous miscellaneous repairs to plumbing and heating apparatus, also constructed 25 coffins for the burial of hospital patients dying under treatment.

The hospital library has been much improved and enlarged by the addition of a number of new medical works, and the operating room is now thoroughly equipped with a good supply of the latest aseptic surgical instruments and appliances.

Under the head of ordinary repairs required during the ensuing

fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary:

Relaying tile floors, \$1,800; new tile floors in halls, \$1,400; painting, \$850; repairs and renewal of window sash, \$200; concrete floors in basement of surgeon's quarters, \$200; concrete floor in ice room, \$50; floors in outbuildings, \$250; sidewalk, \$100; new bath tub, \$80; 4 new doors, \$50; total, \$4,980.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Tile floors in toilet room, \$1,800; tile floors in halls, \$1,400; total, \$3,200.

Marine hospital at Cairo, Ill. (erected 1885).—Asst. Surg. Howard C. Russell makes the following report of repairs and improvements at this hospital station:

General repairs, plumbing, etc., under contract, consisting of tile floor and wainscoting for operating room, tile floors, porcelain bath tubs, new closets, and open plumbing for toilet rooms of wards, painting of roofs of wards, new porch steps and other repairs to surgeon's residence, new porch with door leading to same from second floor of executive building, etc.	\$1,929.00
Washing of one ward ceiling, walls, woodwork: varnishing ceiling and all woodwork; giving walls two coats of paint; painting roofs of stable and attendant's building, executive building and one ward, and the wooden fences; labor furnished by attendants; materials purchased.	167.40
Ten-plate Holtz influence machine, with accessories received during the year.	400.75
Additional operating-room furniture provided.	251.72
Imhausers watchman's clock.	50.00
Repairs to the drying room of laundry.	32.00
Thirty-eight shrubs and trees purchased and planted on the reservation.	20.00
Seven new slabs required for radiators to replace broken ones.	21.00
Total.	2,871.87

Under the head of improvements or unusual repairs for the ensuing year, which may be chargeable to the appropriation "Repairs and preservation of marine hospitals," the medical officer in command recommends the following:

Lumber, assorted, for porches, fences, etc., \$100; repairs for rain gutters of all buildings, \$100; repairs to approaches (54 cubic yards crushed stone), \$150; repairs to floors of laundry and boiler room, \$200; paints, lead, oil, turpentine, brushes, etc., \$350; total, \$900.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Alter windows in surgeon's quarters, \$600; raise and replace roof, surgeon's quarters, \$600; addition to operating room, \$875; porch and entrance for executive building, \$350; artesian well, \$2,500;

concrete walks in reservation, \$800; 2 fire plugs, \$100; boiler house, \$1,500; total, \$7,325.

Hospital at Chicago, Ill. (erected 1873).—Surg. Henry W. Sawtelle makes the following report of repairs and improvements at this hospital station:

Repairs to steam-boiler furnaces, \$157; repairs to plastering throughout the buildings, \$248; new cement floors in pantry, storeroom, and hospital kitchen, \$257; repointing, cleaning, and recalking 3 stone porches, \$118; repairs to heating apparatus, including new steam pump, hot-water tanks, etc., \$822; new bath tubs, water-closets, and washstands, \$348; repainting interior of hospital, \$1,487; resurfacing driveways, \$37.50; minor repairs about the building, \$201; total, \$3,675.50. The old hospital sewer has been discontinued and a new one constructed connecting with the city service, \$1,140. In addition to above, two new book-cases and files case, a new medicine case, set of shelf bottles, new counter (Tennessee marble top), and new medicine supply case—total cost, \$852.20—have been supplied by the Bureau.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Repairs to plumbing, \$2,000; completing stone wall on north side of reservation, \$275; painting and repairing chimney tops and gutters, \$140; glazing bathroom window, \$60; lumber, paints, and hardware, \$300; 2 new sinks, \$260; trees, \$200; total, \$3,235.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Surgeon's house, \$12,000; electric-light plant, \$8,000; iron fence around reservation, \$2,500; total, \$22,500.

Hospital at Cincinnati, Ohio (erected in 1884).—Acting Asst. Surg. J. W. Stevenson, in temporary charge, makes the following report of repairs and improvements at this hospital station:

Repairs to heating apparatus, \$137.15; repairs to drains and walks, \$10; grating over area window, \$11; minor repairs to plumbing, \$18.35; paints for inside of wards done by the attendants, \$75.50; total, \$252.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the acting assistant surgeon recommends the following as necessary: Repairs to buildings, \$200; paints, \$100; lumber, \$20; total, \$320.

Hospital at Cleveland, Ohio (erected in 1852).—P. A. Surg. H. W. Wickes makes the following report of repairs and improvements at this hospital station:

Fence on north and west sides of reservation (completed), \$2,085; reconstructing amphitheater into wards for tubercle cases, \$310; fire hose, hose cart, etc., \$208; repairs to heating apparatus, \$269; construction fire escapes, \$270; new dispensing case and counter, \$373.75; sheathing ceiling over laundry boiler, \$20, 2 water-

closet hoppers, \$34.40; brass pipe and fittings for laundry, \$52.90; new water-closet in steward's quarters, \$34; new circulating boiler in kitchen, \$19; repairs to cooking range, \$5.88; repairs to gutters and conductor pipes, \$12; sink in dispensary, \$65; feed-water heater in laundry, \$142.50; for labor and material painting during the year, \$528.39; total, \$4,429.82.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals," 1901, the medical officer in command recommends the following as necessary: Repairs to and renewing plumbing, \$3,000; labor and material for painting hospital, \$500; new doors, windows, and frames, \$540; lumber and hardware for repairs, \$150; steam fittings and materials for repairs, \$50; new front (outside) doors and casings, \$50; new sash and panels for rear corridor, first floor, \$75; repairs to plastering, \$150; repairs to roof, \$150; total, \$4,665.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Surgeon's quarters, \$12,000; new roof and finishing fourth floor of hospital, \$8,500; grading and improving grounds, \$5,000; sidewalks and curbing, \$2,500; rebuilding and enlarging operating room, \$3,500; storehouse for paints, lumber, and tools, \$500; brick corridor connecting buildings, \$620; total, \$32,620.

Marine hospital at Detroit, Mich. (erected 1857).—Surg. John Godfrey makes the following report of repairs and improvements at this hospital station:

Complete outfit for extinguishing fire, \$332.12; fitting up room for installation steam disinfecting chamber, \$210; replastering old laundry room, \$50; minor repairs to plumbing, \$61.95; renewing main steam and hot-water pipes, \$49.10; cost of material for repairs done by attendants, \$275; material for general repairs to woodwork of different buildings, done by attendants, \$269.01; repairs to roof of boiler house and barn, \$52.98; cement walk laid for isolation ward, drain around area walls, etc., cost of material, \$26.85; minor repairs to heating apparatus, cost of materials, \$78.25; electric-bell system repaired, cost of materials, \$1.71; range in hospital kitchen repaired, cost of materials, \$16.70; new halyards for flagstaff, \$3.50; several windows reglazed, cost of material, \$6.50; total, \$1,433.67.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Paints, \$350; lumber and hardware, \$200; plastering, \$60; cement walk, \$250; granite flagstones and resetting steps, \$150; repairs to dumb-waiter, \$50; new floors in two wards on second floor, \$190; total, \$1,250.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Addition to hospital, \$10,000; cement floors in basement and storerooms, \$1,030; operating room, \$565; total, \$11,595.

Marine hospital at Evansville, Ind. (erected 1891).—P. A. Surg. J. H. Oakley gives the following report of repairs and improvements at this hospital station:

Painting exterior walls of building, \$777; repairs to steam heating apparatus, \$84.75; new flag halyard, \$5; total, \$866.75. Various other minor repairs were made by the engineer and attendants, and work on the new extension wall was begun.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary:

Enlarging porch of surgeon's residence, \$75; building veranda, second floor executive building, \$150; enlarging fuel room, \$340; building pipe-fitting and carpenter shop, \$25; building for cart, kindling wood, paints, and isolation ward, \$325; force pump and connections, \$750; elevated water tank for fire purposes, \$100; repairs of fence, \$50; total, \$1,815.

Marine hospital at Key West, Fla. (erected 1840).—Surg. R. D. Murray gives the following report of repairs and improvements at this hospital station:

The outside walls, pillars, etc., have been whitewashed. The inside walls of rooms, shutters, and woodwork have been painted, as also the isolation ward, closets, bath house, end house, and flagstaff. New floor has been laid in the main ward. Roof and gutters of main building repaired. New bath and water closet erected on the first floor for patients' use. Deadhouse removed as far as possible from public view and reroofed with shingles. Door and window screens repaired. Bathroom in medical officers' quarters inclosed weather-tight and provided with three windows. Nearly all broken and defective lights have been replaced. Stationary blinds on first and second stories changed so as to slide on a metal track. All of the above done by contract at a cost of \$3,926.85. Awnings supplied to 8 windows on west side of building and to porch at steward's quarters, \$50. New stove placed in laundry, \$20. X-ray apparatus, water sterilizer, static electric apparatus, and new instruments for operating room supplied by Bureau. Ward for officers fitted up, capacity 6 beds, \$12. Ducker hospital with capacity for 16 beds fitted up, \$2,187. Eight electric lights installed in the grounds, \$46.45.

Marine hospital at Louisville, Ky. (erected 1852).—P. A. Surg. W. P. McIntosh makes the following report of repairs and improvements at this hospital station:

Ordinary repairs to plumbing, \$120; material for repairing roadway approaches to building (done by attendants), \$10; renewal of stable roof, \$34.50; construction of quarters for assistant surgeon on second floor and furnishing same, \$281.75; repairs to laundry machinery (for material), \$16.50; absorbent drain tile (labor performed by attendants), \$43; pointing up walls with cement, \$2.50; minor repairs to buildings, approaches, and fences by attendants, labor costing \$32.20; temporary fence, for material, \$18.50; paints for wards, second and third floor, \$63.13 (work done by attendants); new steam heating and ventilating plant and new coal room and boiler room constructed, \$4,103; total, \$4,725.08.

Under the head of ordinary repairs required during the ensuing fiscal year which may be chargeable to the appropriation "Repairs

and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Asphalt walk from High street to hospital, \$350; new down spouts from roof of hospital, \$60; fire hose and reels, \$175; 6 fire plugs, \$180; new doors to stable, \$40; painting entire building, \$1,000; steam sterilizer for disinfection, \$500; ordinary repairs to plumbing, \$100; ordinary repairs to approaches, drains, and fences, \$100; total, \$2,505.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a separate appropriation by Congress must be made, the medical officer in command reports the following-named improvements: Surgeon's quarters, \$5,000; steam laundry plant, \$2,500; electric-light plant, \$2,500; iron fence around reservation, \$2,500; total, \$12,500.

Marine hospital at Memphis, Tenn. (erected 1885).—P. A. Surg. G. M. Magruder makes the following report of repairs and improvements at this hospital station:

The external woodwork of all the buildings has been repaired; new workshop erected; tin roofs and shingle roofs repaired; floors in surgeon's kitchen, basement hallway, and pantry renewed; floor in hospital dining room repaired, and new shelving erected in storeroom; cost of labor and material, \$597.04; flagstaff repaired, painted, and reset; cost of material, \$1.20; leaking fire hydrants repaired; cost of material, \$5.03; surgeon's residence provided with new hot-water heating apparatus, and steam-heating plant extended to kitchen building, and otherwise thoroughly repaired; labor and material, \$1,121; windows of surgeon's quarters weather stripped; cost, \$35. All door and window screens repaired, and a large number of repairs to walks, fences, windows, water, gas, and sewer pipes have been done by the attendants; the garden has been leveled off and converted into a lawn, requiring a large amount of labor, which was done by the attendants; total amount expended during the fiscal year, \$1,759.27.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Repairs of plumbing, \$1,474; plastering, \$175.10; resetting mantels and grates, \$95; painting and glazing, \$4,911; repairs of roofs, \$150; repairs of chimneys, \$30; building coal bin, \$150; total, \$6,985.10.

Hospital at Mobile, Ala. (erected 1842).—Surg. R. D. Murray makes the following report of repairs and improvements at this hospital station:

Repairs to range, sink, and pipes, \$13; repairs to gas fixtures, \$11.75; door bell, \$1.75; relaying new water pipe, \$135; relaying terra-cotta pipes, \$15.60; repairing kitchen and dispensary sinks, \$21; repairing windows, \$5.40; cleaning waste pipes, \$3.50; repair of stable lock, 50 cents; repairing broken water pipes, \$27.25; new signal halyard, \$1.25; repairs to 10 grates, \$43.22; total, \$279.22.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Plumbing, \$3,500;

painting, \$2,000; plastering, \$750; repairs to buildings, \$4,500; replace brick walks with cement, \$1,000; total, \$11,750.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Addition to hospital, \$10,000; steam laundry plant, \$5,000; steam heating plant, \$4,500; electric-light plant, \$1,000; isolation ward, \$2,500; flagstaff, \$125; total, \$23,125.

Marine hospital at New Orleans, La. (erected 1885).—P. A. Surg. James A. Nydegger makes the following report of repairs and improvements to this hospital:

Repairs to hospital kitchen and sink, \$26.15; repairs to plumbing, surgeon's quarters, \$10.31; repairs, electric dynamo, \$31.15; repainting iron fence (for material), \$20.50; repairing chimney, kitchen roof, gutters, and roof of assistant surgeon's quarters, \$89; repairs and alterations to smokestack of steam boiler, \$130; repairing heating stoves in wards and officers' quarters, \$99; repairing hot-water heaters, \$39; new floor in stable, \$27.85 (for material); painting roofs of veranda, assistant surgeon's quarters, \$7.50 (for material); lumber for fence, \$36.39; repairing Hyatt water filter, \$8; replacing steam-pipe exhaust, \$13.33; repairs to plumbing, result of forcing water, \$151.49 (for material); other repairs of minor importance were made about the buildings during the year; total, \$689.67.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Paints, \$750; lumber, \$300; cement, \$100; repairs of boiler and machinery in power house, \$150; renewing outside electric-light wires and poles, \$150; repairs of dynamo, \$75; repairs of plumbing, \$125; total, \$1,650.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Quarters for senior assistant surgeon, \$4,500; store-room, \$700; drain tiling for draining reservation, \$1,500; extension of carriage shed, \$200; coal bins, \$200; total, \$7,100.

Marine hospital at Portland, Me. (erected 1859).—Asst. Surg. John McMullen makes the following report of repairs and improvements at this hospital station:

New floor and gangway in coach house, \$157; repairing iron fence around hospital grounds, \$55; new kitchen range, \$139.84; Kny-Scheerer water sterilizer, \$305; miscellaneous repairs, kitchen range, \$18.55; electric-light plant, \$42.41; heating apparatus, \$7.07; painting of floors of verandas and repairs to roof, \$3; contract for painting exterior of hospital authorized before close of year, \$368; total, \$1,095.87.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Paints, \$50; repairs to chimneys, \$75; cement sidewalk, \$250; total, \$375.

Marine hospital at Port Townsend, Wash. (erected 1895).—P. A. Surg. C. H. Gardner makes the following report of repairs and improvements at this hospital station:

Erecting partitions in one of the wards to provide an operating room, \$190.43; erecting partition in smoking room, providing quarters for officers of Revenue-Cutter Service, \$87.81; 3 new water-closet bowls, \$67.50; 1 porcelain-lined bath tub, attendants' room, \$90.50; water-closet, bath tub, and stationary washstand, revenue-cutter officers' room, \$175; 9 spanners for coupling fire hose, \$5.85; 3 porcelain-lined sinks, kitchen pantry and laboratory, \$65; sink and stationary washstand in sterilizing room, \$95; tile floor in operating room, \$260; covering steam pipes with magnesia sectional covering, \$650; repairs to Tobey water heater, \$3.50; supports to partition operating room, \$21.40; top plates for hospital kitchen range, \$25; wire cable for dumb-waiter, \$6.10; minor repairs, heating apparatus, \$4.75; total, \$1,747.84.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Convert window in basement hall into door, \$50; partition of attendants' dining room to provide storeroom, \$30; bath tub, washstand, and closet in steward's quarters, \$175; 2 water-closet bowls, \$40; plastering, \$200; repairs of concrete floor in boiler room, \$50; total, \$545.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Steam laundry plant, \$2,325; deadhouse, \$1,250; total, \$3,575.

Marine hospital at San Francisco, Cal. (erected 1875).—Surg. James M. Gassaway makes the following report of repairs and improvements at this hospital station:

The following have been made by attendants at a cost of material in each case: Painting of buildings, porches, etc., inside and out has continued uninterruptedly throughout the year, \$679.96; water-supply intake pipe lengthened 500 feet, and supported on trestles and pumps repaired, \$100.28; floors, porches, walks, and doors made or renewed, and storerooms with extensive shelving built and window screens supplied, \$130.87; gas, steam, water, and sewer systems overhauled and renewed in places, \$23.73; remodeling old laundry and necropsy building with new sewer connections, \$24.03; kitchen ranges and water heaters repaired, \$6.05; laundry machinery renewals, \$26; enameling ward and quarters bedsteads, \$64.30. The following improvements were made by contract: Executive building cellar excavated, walls and floor concreted, 3 new toilet rooms, complete with new sewer connections and ventilators, and toilet room built in officers' ward, \$1,290; window shades and fixtures placed in 4 wards and executive building, \$183; window and door screens placed in wards, \$232.54; shelf ware in dispensary renewed throughout, \$129; total, \$2,889.76.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Paints, oils, brushes, alcohol,

glass, putty, plaster, wire cloth, hardware, doors, and lumber for renovating the station, \$1,500; for repairs to or renewing floors, roofs, porches, walks, etc., including lumber, shingles, nails, locks, staples, plaster, etc., \$2,000; to improve the hot-water supply of the station, \$1,200; acetylene-gas-making machine to replace gas machine, \$400; miscellaneous plumbing supplies, including new bath tub, \$300; total, \$5,400.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Surgeon's residence, \$8,000; assistant surgeon's cottage, \$5,000; mortuary, \$800; isolation ward, \$1,400; approaches and roadway, \$4,000; artesian well, \$500; electric-light plant, \$2,500; barn and ambulance house, \$800; total, \$23,000.

Marine hospital at St. Louis, Mo. (erected 1885).—P. A. Surg. William G. Stimpson makes the following report of repairs and improvements at this hospital station:

A new cast-iron sewer was laid under the kitchen, \$20; 4 stone filters were placed in surgeon's kitchen, hospital kitchen, dressing room and kitchen in steward's quarters, \$175; repairs to fences, walks, etc., \$76.10; new chimney to dead-house, \$24; relaying tile floor in executive building, \$18; repairing kitchen range and new hood placed over it, \$60.50; new bath tub and repairs to plumbing in steward's quarters, \$85; new steps in covered walk, \$18; new screen doors and windows, \$16.50; new ventilator boiler room, \$158; 2 new desks, 2 revolving chairs, 2 office chairs, and carpet steward's office, \$98; repapering steward's parlor, \$35; new furniture and carpets, surgeon's and steward's quarters, \$139.60; repairs to roof of boiler and laundry house, \$80; new metal smokestack on boiler house, \$227; new shelf bottles for dispensary, \$14.11; sink in bacteriological laboratory, \$18; new stair carpet in executive building, \$23.75; repairing plaster, \$190; painting walls and woodwork, surgeon's and assistant surgeon's quarters, halls, kitchen, dining rooms, pantries, storeroom, and bathroom and the attendants' quarters, \$213.90; material for waxing floors, \$40, work done by attendants; remodeling beds in wards by attendants, material, \$10; new hydrant and hopper in stable, \$18; new quartz filter plant and connections, \$980; 2 new veranda awnings, \$24.75. The road next to the old hospital building was filled in, sodded, and a new road built to Winnebago street by the attendants. The old garden has been plowed, leveled, and sown in grass seed by the attendants at a cost of material of \$4.75; the lawn was raked up and sown in lawn grass by the attendants, cost of seed, \$18.30; total, \$2,786.26.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Repairs of buildings, \$750; painting, \$1,600; gravel driveways, \$560; total, \$2,910.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed appropriations: Surgeon's residence, \$15,000; iron fence in front of reservation, \$5,000; barbed-wire fence on sides and rear of reserva-

tion, \$1,200; concrete sidewalks, \$2,500; electric-light wiring, \$1,000; total, \$24,700.

Marine hospital at Vineyard Haven, Mass. (erected 1895).—Surg. F. W. Mead makes the following report of repairs and improvements at this hospital station:

The exterior of the hospital, dining room, and kitchen were painted two coats by the attendants at a cost of material of \$92. The severe storm of November 27-28 caused bad leakage of the entire front of the hospital building, beating under the shingles, sweeping down beneath the sheathing and laths. The work of making necessary repairs was done under contract through the office of the Supervising Architect at a cost of \$295. Leaks in water pipes which had frozen and burst on account of the severe cold weather repaired at a cost of \$7.49; 4 fire escapes were erected, 2 front and 2 in the rear, at a cost of \$188; dark room for photographic purposes constructed inside the building, material costing \$20, work done by attendants; 30 awnings, \$112.25; 3 gates of galvanized iron, \$21.30; 50-gallon Brown Brothers copper boiler, \$63; paints, oils, etc., for painting fence, etc., \$24.50; lumber for constructing shelving and repairing baseboards, etc., \$55, work done by attendants; contract for painting interior of the buildings was let for the sum of \$624, and is now under way; cost of work for excavating, concreting, etc., space for steam disinfecting chamber, \$675; expended in extension of electric call-bell system, work done by the attendants, \$20; total, \$2,497.54.

Marine hospital at Wilmington, N. C. (erected 1859).—P. A. Surg. C. P. Wertenbaker makes the following report of repairs and improvements at this hospital station:

New window shades for the executive building, hospital, and tubercle ward, \$72.50; wire screens for buildings and wards, \$25; wiring building for electric lighting, \$200; 340 yards China matting for executive building, \$92; steam heating apparatus, \$664.90; fire-extinguishing apparatus, \$234.85; repairing sewer from executive building, \$198; executive building has been extensively repaired, painted, etc., second floor remodeled and converted into officers' quarters, bathrooms remodeled, supplied with modern sanitary fixtures, plumbing renewed, walls have been patched, and in other rooms plastering renewed, and all the interior of the first and second stories repainted; total cost, \$1,434.09. Dayton wagon for use as an ambulance and for general use, \$175. Total, \$3,096.34.

Under the head of ordinary repairs required during the ensuing fiscal year, which may be chargeable to the appropriation "Repairs and preservation marine hospitals, 1901," the medical officer in command recommends the following as necessary: Inside blinds should be put in the executive building, outside wood and iron work repainted and repaired, estimated cost, \$500; the fence surrounding three sides of the inclosure is rotten and should be renewed, estimated cost, \$500; Total, \$1,000.

Under the head of improvements or unusual repairs for the ensuing fiscal year, for which a special appropriation by Congress must be made, the medical officer in command reports the following needed improvements: Grading grounds, \$500.

MARINE HOSPITAL FOR THE PORT OF NEW YORK.

Attention is again invited to the necessity of the Government possessing a hospital of its own for the great port of New York. The

present arrangement, involving the necessity of leasing a building for periods of from one to three years, is unsatisfactory, and it is recommended that the attention of Congress be again invited to the matter.

[Marine-Hospital Service, Department Circular No. 78, 1899.]

CONTRACTS FOR CARE OF SEAMEN, ETC.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL U. S. M. H. S.,

Washington, D. C., June 5, 1899.

The following contracts for the care of seamen entitled to relief from this service for the fiscal year ending June 30, 1900, are published for the information of accounting officers of the Treasury Department, disbursing agents, commissioned medical officers, and acting assistant surgeons of the Marine-Hospital Service, and customs officers. This circular is to be regarded as official notification of the acceptance of the proposals made by the parties designated, and must be cited, giving its number and date, on all bills for the treatment and maintenance of seamen, and for the burial of deceased hospital patients, as the authority for any expenditure incurred under its provisions. Charges will be allowed for the day of admission of a hospital patient, but not for the day of discharge or death. The right is reserved by the Secretary of the Treasury to terminate any contract whenever the interests of the service require it. All relief must be furnished in accordance with the revised regulations of the Marine-Hospital Service; and, in consequence of the large expenditure for relief, and of the limited sources of income, it has become necessary to give notice that, as provided in the regulations, no allowance will be made for expenditures incurred at any port not named in this circular.

Upon admission to a contract hospital of a patient with a disease or injury which, in the opinion of the medical officer, the acting assistant surgeon, or physician in charge of the case, will require more than twenty days' treatment in hospital, the officer issuing the permit will at once request authority from the Bureau to transfer such patient to the nearest marine hospital, provided the patient's condition, in the opinion of the medical officer, the acting assistant surgeon, or physician in charge of the case, is such as to admit of transportation.

The attention of customs officers, commissioned medical officers, acting assistant surgeons, or other physicians in charge of patients of the Marine-Hospital Service at contract stations is hereby called to the necessity of discharging patients promptly upon the termination of the necessary hospital treatment, and without awaiting the expiration of the period authorized in the permit.

The term "contagious diseases," whenever occurring in this circular, includes only those diseases which, under usual municipal regulations, are required to be treated in a special hospital for contagious diseases.

WALTER WYMAN,
Supervising Surgeon-General U. S. M. H. S.

Approved,

L. J. GAGE, *Secretary of the Treasury.*

Albany, N. Y.—The medical attendance to be furnished by an acting assistant surgeon: Albany Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day.

Apalachicola, Fla.—Dr. J. D. Rush to furnish medical attendance and medicines at \$40 a month; Martha Campbell to furnish quarters, subsistence, and nursing, including contagious diseases, at \$1 a day, and to provide for the burial of deceased patients at \$15 each.

Ashland, Wis.—Dodd's Hospital to furnish quarters, subsistence, nursing, medical attendance, and medicines at 75 cents a day, contagious diseases \$1 a day, and to provide for the burial of deceased patients at \$9 each.

Ashtabula, Ohio.—The medical attendance to be furnished by an acting assistant surgeon; Mrs. Henry Whippley to furnish quarters, subsistence, and nursing at \$1 a day; contagious diseases, \$1.50 a day; John Ducro & Sons to provide for the burial of deceased patients at \$14.50 each.

Astoria, Oreg.—The medical attendance to be furnished by an acting assistant surgeon; St. Mary's Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day.

Baltimore, Md.—Hospital patients to be cared for in the United States Marine Hospital; Albert F. Philbin to provide for the burial of deceased patients at \$16 each.

Bangor, Me.—The medical attendance to be furnished by an acting assisting surgeon; Helen M. Stratton to furnish quarters, subsistence, and nursing at \$1 a day; Abel Hunt to provide for the burial of deceased patients at \$10 each.

Bath, Me.—The medical attendance to be furnished by an acting assistant surgeon. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Portland, Me.

Beaufort, N. C.—The medical attendance to be furnished by an acting assistant surgeon; Charles L. Duncan to furnish quarters, subsistence, and nursing at \$1 a day and to provide for the burial of deceased patients at \$15 each.

Bismarck, N. Dak.—The medical attendance to be furnished by an acting assistant surgeon; Lamborn Hospital to furnish quarters, subsistence, and nursing at 90 cents a day; contagious diseases at \$2 a day; Webb Brothers to provide for the burial of deceased patients at \$15 each.

Boothbay Harbor, Me.—The medical attendance to be furnished by an acting assistant surgeon.

Boston, Mass.—Hospital patients to be cared for in the United States Marine Hospital at Chelsea, Mass.; burial of deceased patients at the hospital cemetery; burial of foreign patients at \$10 each.

Bridgeport, Conn.—Bridgeport Hospital to furnish quarters, subsistence, nursing, medical attendance, and medicines at \$1 a day; Hawley, Wilnot & Reynolds to provide for the burial of deceased patients at \$16 each.

Brownsville, Tex.—The medical attendance to be furnished by an acting assistant surgeon.

Brunswick, Ga.—The medical attendance to be furnished by an acting assistant surgeon; Johanna Foley to furnish quarters, subsistence, and nursing at \$1 a day; contagious diseases at \$1.50 a day; C. G. Moore to provide for the burial of deceased patients at \$15 each.

Buffalo, N. Y.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service; Buffalo Hospital (Sisters of Charity) to furnish quarters, subsistence, nursing, and medicines at \$1 a day; the health commissioners of the city of Buffalo to care for contagious diseases at \$2 a day; McDonald & Ray to provide for the burial of deceased patients at \$10 each.

Burlington, Iowa.—St. Francis's Hospital to furnish quarters, subsistence, medical attendance, nursing, and medicines at 70 cents a day, including contagious diseases; I. Prugh & Sons to provide for the burial of deceased patients at \$15 each.

Burlington, Vt.—The medical attendance to be furnished by an acting assistant surgeon.

Cairo, Ill.—Hospital patients to be cared for in the United States Marine Hospital; L. E. Falconer to provide for the burial of deceased patients at \$5 each.

Cambridge, Md.—The medical attendance to be furnished by an acting assistant surgeon; United Charities Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day.

Charleston, S. C.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service: St. Francis Xavier's Infirmary to furnish quarters, subsistence, nursing, and medicines at 95 cents a day; contagious diseases at \$2 a day, and to provide for the burial of deceased patients at \$12 each.

Chattanooga, Tenn.—The medical attendance to be furnished by an acting assistant surgeon; Hamilton County Hospital to furnish quarters, subsistence, nursing, and medicines at 60 cents a day; contagious diseases at \$2 a day; the Chickamauga Undertaking Company to provide for the burial of deceased patients at \$10 each.

Chicago, Ill.—Hospital patients to be cared for in the United States Marine Hospital; B. E. Arntzen to provide for the burial of deceased patients at \$13.50 each.

Cincinnati, Ohio.—Hospital patients to be cared for in the United States Marine Hospital; dispensary at the hospital, southeast corner of Third and Kilgour streets; F. & W. Siefke to provide for the burial of deceased patients at \$12 each.

Cleveland, Ohio.—Hospital patients to be cared for in the United States Marine Hospital; Flynn, Abel & Froelk to provide for the burial of deceased patients at \$14 each and to furnish ambulance service at \$1 for each patient.

Corpus Christi, Tex.—The medical attendance to be furnished by an acting assistant surgeon.

Crisfield, Md.—The medical attendance to be furnished by an acting assistant surgeon.

Darien, Ga.—The medical attendance to be furnished by an acting assistant surgeon.

Delaware Breakwater, Del.—Hospital patients to be cared for in the United States Marine Hospital; Henry F. Conwell to provide for the burial of deceased patients at \$11 each.

Detroit, Mich.—Hospital patients to be cared for in the United States Marine Hospital; J. W. Maney Company to provide for the burial of deceased patients at \$7.75 each.

Dubuque, Iowa.—The medical attendance to be furnished by an acting assistant surgeon; St. Joseph's Mercy Hospital to furnish ambulance service, quarters, subsistence, nursing, and medicines at 80 cents a day; John A. Voelker to provide for the burial of deceased patients at \$10 each.

Duluth, Minn.—The medical attendance to be furnished by an acting assistant surgeon; St. Luke's Hospital to furnish quarters, subsistence, nursing, and medicines at 75 cents a day; John W. Stewart to provide for the burial of deceased patients at \$15 each.

Edenton, N. C.—R. Dillard, M. D., to furnish quarters, subsistence, nursing, medical attendance, and medicines at \$2 a day; contagious diseases at \$3 a day; for out-patients, \$1 will be allowed for each medical examination and 25 cents additional for each time medicine is furnished; L. F. Ziegler to provide for the burial of deceased patients at \$10 each.

Edgartown, Mass.—Patients requiring hospital care and treatment, if able to bear transportation, will be sent to the United States Marine Hospital at Vineyard Haven, Mass.

Elizabeth City, N. C.—The medical attendance to be furnished by an acting assistant surgeon.

Ellsworth, Me.—The medical attendance to be furnished by an acting assistant surgeon. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Portland, Me.

Erie, Pa.—The medical attendance to be furnished by an acting assistant surgeon; Hamot Hospital Association to furnish quarters, subsistence, nursing, and medicines at 71 cents a day; the board of health of the city of Erie to care for contagious cases at \$3 a day.

Escanaba, Mich.—The medical attendance to be furnished by an acting assistant surgeon; Delta County Hospital to furnish quarters, subsistence, and nursing at \$1 a day; D. A. Oliver to provide for the burial of deceased patients at \$15 each.

Eureka, Cal.—The medical attendance to be furnished by an acting assistant surgeon; Maria Anderson to furnish quarters, subsistence, nursing, and medicines at \$1 a day; F. F. Pierce to provide for the burial of deceased patients at \$12.25 each.

Evansville, Ind.—Hospital patients to be cared for in the United States Marine Hospital; Henry Klee & Son to provide for the burial of deceased patients at \$11 each.

Fernandina, Fla.—The medical attendance to be furnished by an acting assistant surgeon; A. G. Webster to furnish quarters, subsistence, and nursing at \$1 a day; contagious diseases at \$2 a day; R. M. Henderson to provide for the burial of deceased patients at \$16 each.

Fredericksburg, Va.—The medical attendance to be furnished by an acting assistant surgeon; Amelia Parrott to furnish quarters, subsistence, and nursing at 90 cents a day; George Nossett to provide for the burial of deceased patients at \$12.50 each.

Gallipolis, Ohio.—The medical attendance to be furnished by an acting assistant surgeon; Harriet J. Kinder to furnish quarters, subsistence, and nursing at 80 cents a day, contagious diseases at \$2 a day, and to provide office quarters for the acting assistant surgeon at \$10 a month. Patients who require hospital treatment, and whose condition, in the opinion of the acting assistant surgeon, will permit their transportation with perfect safety, shall be sent to the marine hospital at Cincinnati, Ohio.

Galveston, Tex.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service; St. Mary's Infirmary to furnish ambulance service, quarters, subsistence, nursing, and medicines at \$1 a day, contagious diseases at \$2 a day, and to provide for the burial of the deceased patients at \$10 each.

Georgetown, S. C.—The medical attendance to be furnished by an acting assistant surgeon; M. E. Lang to furnish quarters, subsistence, and nursing in cases of white patients at \$1 a day; Julius Singleton to furnish quarters, subsistence, and nursing in cases of colored patients at \$1 a day; Allen P. Hazard to provide for the burial of deceased patients at \$15 each. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Wilmington, N. C.

Gloucester, Mass.—The medical attendance to be furnished by an acting assistant surgeon; Addison Gilbert Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Boston, Mass.

The Government Hospital for the Insane, District of Columbia.—Under act of Congress, March 3, 1875, to furnish quarters, subsistence, nursing, medical attendance, and medicines at \$4.50 a week for each insane patient admitted upon the order of the Secretary of the Treasury.

Grand Haven, Mich.—The medical attendance to be furnished by an acting assistant surgeon; Anna Farnham to furnish quarters, subsistence, and nursing at \$1 a day; A. Kiel to provide for the burial of deceased patients at \$12 each.

Green Bay, Wis.—The medical attendance to be furnished by an acting assistant surgeon.

Hartford, Conn.—The Hartford Hospital to furnish quarters, subsistence, nursing, medical attendance, and medicines at \$1 a day; contagious diseases at \$2.15 a day; G. W. Woolley & Son to provide for the burial of deceased patients at \$13 each.

Jacksonville, Fla.—The medical attendance to be furnished by an acting assistant surgeon; Mrs. Eugenie Barr to furnish quarters, subsistence, and nursing at \$1 a day; W. H. Jones to care for contagious diseases at \$2 a day; Clark & Burns Company to provide for the burial of deceased patients at \$3.50 each.

Juneau, Alaska.—The medical attendance to be furnished by an acting assistant surgeon; St. Ann's Hospital to furnish quarters, subsistence, nursing, and medicines at \$2 a day.

Key West, Fla.—Hospital patients to be cared for in the United States Marine Hospital.

La Crosse, Wis.—The medical attendance to be furnished by an acting assistant surgeon; St. Francis's Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day.

Little Rock, Ark.—The medical attendance to be furnished by an acting assistant surgeon; Little Rock Infirmary to furnish quarters, subsistence, nursing, and medicines at \$1 a day; W. H. Tindall to provide for the burial of deceased patients at \$15 each.

Louisville, Ky.—Hospital patients to be cared for in the United States Marine Hospital; W. S. Melton to provide for the burial of deceased patients at \$13 each.

Ludington, Mich.—The medical attendance to be furnished by an acting assistant surgeon; Mrs. H. D. Linsley to furnish quarters, subsistence, and nursing at 80 cents a day; H. M. Hallett to provide for the burial of deceased patients at \$14.99 each.

Machias, Me.—The medical attendance to be furnished by an acting assistant surgeon; S. W. Hill to furnish quarters, subsistence, and nursing at \$1 a day; L. H. Hanscom to provide for the burial of deceased patients at \$12 each.

Manistee, Mich.—The medical attendance to be furnished by an acting assistant surgeon; Mercy Hospital to furnish quarters, subsistence, nursing, and medicines at 90 cents a day; W. P. Switzer to provide for the burial of deceased patients at \$11.60 each.

Marquette, Mich.—The medical attendance to be furnished by an acting assistant surgeon; St. Mary's Hospital to furnish quarters, subsistence, nursing, and medicines at 70 cents a day, contagious diseases at \$1.90 a day, and to provide for the burial of deceased patients at \$6.45 each.

Marshfield, Oreg.—The medical attendance to be furnished by an acting assistant surgeon; John Snyder to furnish quarters, subsistence, nursing, and medicines at \$1.20 a day.

Memphis, Tenn.—Hospital patients to be cared for in the United States Marine Hospital; E. D. Thompson & Co. to provide for the burial of deceased patients at \$7.99 each.

Milwaukee, Wis.—The medical attendance to be furnished by an acting assistant surgeon; St. Mary's Hospital to furnish quarters, subsistence, nursing, and medicines at 80 cents a day. Patients who require hospital treatment, and whose condition, in the opinion of the acting assistant surgeon, will permit their transportation with perfect safety, shall be sent to the marine hospital at Chicago, Ill.

Mobile, Ala.—Hospital patients to be cared for in the United States Marine Hospital; Bérroujon, Sands & Co. to provide for the burial of deceased patients at \$10.25 each.

Nashville, Tenn.—The medical attendance to be furnished by an acting assistant surgeon; Nashville City Hospital to furnish quarters, subsistence, nursing, and medicines at 90 cents a day; W. R. Cornelius & Co. to provide for the burial of deceased patients at \$11 each.

New Bedford, Mass.—The medical attendance to be furnished by an acting assistant surgeon. Patients requiring hospital care and treatment, if able to bear transportation, will be sent to the United States Marine Hospital at Vineyard Haven, Mass.

Newbern, N. C.—The medical attendance to be furnished by an acting assistant surgeon; Susan A. Collins to furnish quarters, subsistence, and nursing at 90 cents a day.

New Haven, Conn.—The medical attendance to be furnished by an acting assistant surgeon; the General Hospital Society of Connecticut to furnish quarters, subsistence, nursing, and medicines at \$1 a day, and to provide for the burial of deceased patients at \$15 each; the city of New Haven to care for contagious diseases at \$3 a day.

New London, Conn.—The medical attendance to be furnished by an acting assistant surgeon; Memorial Hospital Association to furnish quarters, subsistence, nursing, and medicines at \$1.50 a day; Caulkins & Prentiss to provide for the burial of deceased patients at \$13.50 each. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Stapleton, N. Y.

New Orleans, La.—Hospital patients to be cared for in the United States Marine Hospital; Jos. J. McMahon Company to provide for the burial of deceased patients at \$8.50 each.

Newport, Ark.—The medical attendance to be furnished by an acting assistant surgeon; William Littleton to furnish quarters, subsistence, and nursing at \$1 a day; R. F. Drummond to provide for the burial of deceased patients at \$10 each.

Newport, R. I.—The medical attendance to be furnished by an acting assistant surgeon; Newport Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day; Edward P. Marsh to provide for the burial of deceased patients at \$14.75 each.

Newport News, Va.—The medical attendance to be furnished by an acting assistant surgeon. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Baltimore, Md.

New York, N. Y.—Hospital patients to be cared for in the marine hospital, Stapleton, Staten Island, N. Y.; Edmund Schaefer to provide for the burial of deceased patients at \$12 each.

Norfolk, Va.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service; St. Vincent's Hospital to furnish quarters, subsistence, nursing, ambulance service, and medicines at 85 cents a day; the Norfolk city board of health to care for contagious diseases at \$2.50 a day; J. L. Morris & Co. to provide for the burial of deceased patients at \$11.50 each.

Ogdensburg, N. Y.—The medical attendance to be furnished by an acting assistant surgeon; City Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day; contagious diseases at \$2 a day; H. S. Nuttall to provide for the burial of deceased patients at \$9.23 each.

Oswego, N. Y.—The medical attendance to be furnished by an acting assistant surgeon; Oswego Hospital to furnish quarters, subsistence, nursing and medicines at \$1 a day; John F. Dain & Son to provide for the burial of deceased patients at \$15 each.

Pensacola, Fla.—The medical attendance to be furnished by an acting assistant surgeon; Anderson & Crowell to furnish quarters, subsistence, nursing, and medicines at \$1 a day; contagious diseases, \$3 a day.

Philadelphia, Pa.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service; German Hospital to furnish ambulance service, quarters, subsistence, nursing, medicines, and one interne, including contagious diseases, at \$1 a day, and to provide for the burial of deceased patients at \$15 each.

Pittsburg, Pa.—The medical attendance to be furnished by a medical officer of Marine-Hospital Service; Mercy Hospital to furnish quarters, subsistence, nursing, medicines, and a resident physician at 94 cents a day, and \$2 a day for contagious diseases; Burns & Giltinan to provide for the burial of deceased patients at \$15 each.

Port Huron, Mich.—The medical attendance to be furnished by an acting assistant surgeon.

Portland, Me.—Hospital patients to be cared for in the United States Marine Hospital; Ilsley Brothers to provide for the burial of deceased patients at \$11 each.

Portland, Oreg.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service; St. Vincent's Hospital to furnish quarters, subsistence, nursing, and medicines at 80 cents a day; contagious diseases at \$2 a day; F. S. Dunning to provide for the burial of deceased patients at \$5 each.

Portsmouth, N. H.—The medical attendance to be furnished by an acting assistant surgeon; Cottage Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day; Oliver W. Ham to provide for the burial of deceased patients at \$12 each.

Port Tampa, Fla.—The medical attendance to be furnished by an acting assistant surgeon; R. F. Altree to furnish quarters, subsistence, and nursing at \$1 a day; M. Lovengreen to provide for the burial of deceased patients at \$9 each.

Port Townsend, Wash.—Hospital patients to be cared for in the United States Marine Hospital; Port Townsend Undertaking Company to provide for the burial of deceased patients at \$16 each.

Providence, R. I.—The medical attendance to be furnished by an acting assistant surgeon; Frederick Martin to furnish quarters, subsistence, and nursing at \$1.50 a day; Thomas F. Monohan to provide for the burial of deceased patients at \$15 each. Patients who require hospital treatment, and whose condition, in the opinion of the acting assistant surgeon, will permit their transportation with perfect safety, will be sent to the marine hospital at Boston, Mass.

Richmond, Va.—The medical attendance to be furnished by an acting assistant surgeon; "Retreat for the Sick" Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day; J. B. Harris to provide for the burial of deceased patients at \$14.75 each.

Rockland, Me.—The medical attendance to be furnished by an acting assistant surgeon. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Portland, Me.

Saginaw, Mich.—The medical attendance to be furnished by an acting assistant surgeon; St. Mary's Hospital to furnish quarters, subsistence, nursing, and medicines at 90 cents a day; contagious diseases at \$2 a day.

St. Louis, Mo.—Hospital patients to be cared for in the United States Marine Hospital; J. H. Gebken to provide for the burial of deceased patients at \$11.50 each.

St. Paul, Minn.—The medical attendance to be furnished by an acting assistant surgeon; St. Joseph's Hospital to furnish quarters, subsistence, nursing, and medicines at 85 cents a day.

San Diego, Cal.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service; San Diego Sanitarium to furnish quarters, subsistence, nursing, and ambulance service at \$1 a day; W. W. Whitson & Co. to provide for the burial of deceased patients at \$13.50 each.

Sandusky, Ohio.—The medical attendance to be furnished by an acting assistant surgeon; Good Samaritan Hospital to furnish quarters, subsistence, and nursing at \$1 a day; Charles J. Andrus to provide for the burial of deceased patients at \$13.25 each.

San Francisco, Cal.—Hospital patients to be cared for in the United States Marine Hospital; burial of deceased patients at the hospital cemetery; burial of foreign seamen at \$10 each.

San Pedro, Cal.—Ira E. Coe, M. D., to furnish quarters, subsistence, nursing, medical attendance, and medicines at 90 cents a day, contagious diseases at \$1.50 a day, and to provide for the burial of deceased patients at \$10 each.

Sault Ste. Marie, Mich.—The medical attendance to be furnished by an acting assistant surgeon.

Savannah, Ga.—The medical attendance to be furnished by a medical officer of

the Marine-Hospital Service; St. Joseph's Infirmary to furnish quarters, subsistence, nursing, and medicines at \$1 a day; Joseph Goette to provide for the burial of deceased patients at \$9 each.

Seattle, Wash.—The medical attendance to be furnished by a medical officer of the Marine-Hospital Service; Providence Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day; Bonney & Stewart to provide for the burial of deceased patients at \$2.50 each. Patients requiring hospital treatment will, if able to bear transportation, be sent to the marine hospital at Port Townsend, Wash.

Shreveport, La.—The medical attendance to be furnished by an acting assistant surgeon; the Shreveport Sanitorium to furnish quarters, subsistence, nursing, and medicines at 95 cents a day.

Solomons, Md.—The medical attendance to be furnished by an acting assistant surgeon; M. F. Morrison to furnish subsistence, nursing, fuel, and lights at \$1 a day; J. J. Saunders to provide for the burial of deceased patients at \$8 each.

Sturgeon Bay, Wis.—The medical attendance to be furnished by an acting assistant surgeon; Maggie Dunlap to furnish quarters, subsistence, and nursing at \$1 a day; H. J. Hahn to provide for the burial of deceased patients at \$13.50 each.

Superior, Wis.—The medical attendance to be furnished by an acting assistant surgeon; St. Mary's Hospital to furnish quarters, subsistence, nursing, and medicines, including contagious diseases, at 90 cents a day.

Tacoma, Wash.—The medical attendance to be furnished by an acting assistant surgeon; Fannie C. Paddock Memorial Hospital to furnish quarters, subsistence, nursing, and medicines at 60 cents a day; contagious diseases at \$3 a day; Conrad L. Hoska to provide for the burial of deceased patients at \$9 each.

Tappahannock, Va.—Dr. William Taliaferro to furnish quarters, subsistence, nursing, medical attendance, and medicines at Tappahannock at \$1.50 a day, contagious diseases at \$2.50 a day, and provide for the burial of deceased patients at \$12 each; Dr. W. J. Newbill at Carters Creek at 95 cents a day, including contagious diseases, and to provide for the burial of deceased patients at \$10 each; and Dr. W. S. Christian at Urbana at \$1.50 a day, and to provide for the burial of deceased patients at \$10 each.

Toledo, Ohio.—The medical attendance to be furnished by an acting assistant surgeon; Toledo Hospital Association to furnish quarters, subsistence, nursing, and medicines at 75 cents a day, contagious diseases at \$1.50 a day, and to provide for the burial of deceased patients at \$12 each.

Vicksburg, Miss.—The medical attendance to be furnished by an acting assistant surgeon; Vicksburg City Hospital to furnish quarters, subsistence, nursing, and medicines at \$1 a day; J. Q. Arnold to provide for the burial of deceased patients at \$12 each.

Vineyard Haven, Mass.—Hospital patients to be cared for in the United States Marine Hospital; Hinckley & Renear to provide for the burial of deceased patients at \$10 each.

Washington, D. C.—The medical attendance to be furnished by a medical officer of the Marine Hospital Service; Providence Hospital to furnish quarters, subsistence, nursing, interne attendance, and medicines at 75 cents a day, and to provide for the burial of deceased patients at \$15 each.

Wheeling, W. Va.—The medical attendance to be furnished by an acting assistant surgeon; Wheeling Hospital to furnish quarters, subsistence, nursing, and medicines at 75 cents a day.

Wilmington, N. C.—Hospital patients to be cared for in the United States Marine Hospital; D. C. Evans to provide for the burial of deceased patients at \$14 each.

At the following-named ports the rate for quarters, subsistence, and nursing will, in each special case, be fixed by the Bureau, upon the recommendation of the

proper officer, in accordance with the regulations of the Marine-Hospital Service, paragraphs 446 and 447:

Bath, Me.; Boothbay Harbor, Me.; Brownsville, Tex.; Burlington, Vt.; Corpus Christi, Tex.; Crisfield, Md.; Darien, Ga.; Elizabeth City, N. C.; Ellsworth, Me.; Green Bay, Wis.; New Bedford, Mass.; Newport News, Va.; Port Huron, Mich.; Rockland, Me.; Sault Ste. Marie, Mich.

At the following-named ports hospital or other relief will be furnished only under the provisions of the regulations of the Marine-Hospital Service, paragraphs 408, 410, 446, and 613:

Barnstable, Mass.; Beaufort, S. C.; Belfast, Me.; Castine, Me.; Cedar Keys, Fla.; Chatham, Mass.; Dennis, Mass.; Eastport, Me.; Edgartown, Mass.; Hyannis, Mass.; Perth Amboy, N. J.; Provincetown, Mass.; Sag Harbor, N. Y.; Salem, Mass.; Sitka, Alaska; Somers Point, N. J.; Waldoboro, Me.; Wilmington, Del.; Wiscasset, Me.

The rate of charge for seamen from vessels of the Coast Survey, admitted to hospital under the provisions of the regulations, and of foreign seamen, admitted under the act of March 3, 1875, is hereby fixed at the uniform rate of \$1 a day.

ESTABLISHMENT OF A SANATORIUM FOR TUBERCULOUS PATIENTS.

Referring to Bureau circular letter relative to the treatment of tuberculous patients, issued August 2, 1898, and the answers received from the officers in command of the several marine hospitals of the Service, the advantages to be derived by the establishment of a sanatorium, which had previously been considered, were more prominently brought forward, and an officer of the Service was detailed to visit several abandoned Government reservations in the South and Southwest, with a view to ascertaining whether there was any place in the possession of the Government suitable for the care of cases of this disease. After visiting a large number of places in the region mentioned, Fort Stanton, N. Mex., was finally decided upon as the most advantageous, and steps were taken to obtain possession of the same. It was found upon investigation that this property had been turned over by the War Department to the Interior Department, and application was therefore made to the Department of the Interior requesting the control of the Fort Stanton abandoned military reservation.

By Executive order of April 1, 1899, the old military reservation located in New Mexico, and known as Fort Stanton, containing some 10,240 acres, more or less, with the buildings thereon, was set apart for the use of the Marine-Hospital Service, the object being to establish in that arid region a sanatorium for the treatment and possible cure of seamen of the merchant marine suffering with pulmonary tuberculosis. Owing to this property having long been abandoned as a military reservation (temporarily in the custody of the Interior Department), it had suffered from depredations to such an extent as to render it uninhabitable without extensive repairs; and it was believed at the time of the transfer that these repairs could be paid from the marine-hospital fund; but, later on, under the decision of the Comptroller of the Treasury, said fund was found to be not available, and it therefore

becomes necessary to call upon Congress for legislative assistance. It is believed that with proper equipment, with perhaps considerable outlay in the beginning, the station will become almost self-supporting by cultivation of the ground, the establishment of a cattle ranch, the raising of fowls, etc.; in short, utilizing the property on the principle of a ranch, one of the objects of the establishment being to give the seamen suffering with incipient pulmonary tuberculosis moderate outdoor exercise, and at the same time an object in life, as idleness would only add to their troubles. As an arid region is considered (by those who have given the subject of tuberculosis a study) to be the best for the treatment and arrest of this disease, the lack of water has to be met by irrigation, requiring the expenditure of several thousands of dollars, and as this reservation is isolated it must be provided with all the machinery and implements necessary for its proper maintenance. All of the buildings require extensive repairs and some of them partial rebuilding, and the addition of a number of cottages is desirable for the segregation of tuberculous patients. To place this sanatorium in successful operation an appropriation of \$75,000 is necessary.

The following correspondence was had in obtaining possession of the Fort Stanton Reservation:

TREASURY DEPARTMENT,

Washington, D. C., November 14, 1898.

SIR: The Surgeon-General of the Marine-Hospital Service is making an investigation relative to the subject of tuberculosis, with a view to recommending the establishment of a sanatorium for the treatment of tuberculous patients of the Marine-Hospital Service in the arid region of New Mexico or Arizona. In the prosecution of this investigation he proposes to have certain Government reservations in this region inspected by P. A. Surg. J. O. Cobb, United States Marine-Hospital Service, whom I wish to introduce to you by this letter, with the request that you will extend to him such aid as you can, particularly with reference to furnishing him with information relative to the location of Government reservations which might be available for the purpose indicated.

Thanking you in advance for any courtesies shown Dr. Cobb in this matter, I am,
Very respectfully, yours,

O. L. SPAULDING, *Acting Secretary.*

THE SECRETARY OF THE INTERIOR.

TREASURY DEPARTMENT,

OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,

Washington, D. C., November 28, 1898.

SIR: I have the honor to represent that for a number of years the matter of prevalence of tuberculosis of the lungs among seamen has been one which has given the officers of the Marine-Hospital Service and the Bureau much food for reflection in that such a large percentage of the chronic cases in the hospitals are of this character, and that no appreciable favorable results are obtained in their treatment. Orders have been issued for the isolation of tuberculous patients, inasmuch as it is now positively known that this is a contagious disease, but this isolation is, as a matter of administration, very difficult; and there is no doubt

that the keeping of tuberculous patients in a hospital ward with patients who have been received for other diseases endangers the latter. At least four regularly commissioned officers of the service, one hospital steward, and a number of attendants have contracted tuberculosis by reason of their intimate association with the patients of this character in the wards. Therefore, in the interests of other patients in these hospitals, in the interests of the medical officers of the Service, the stewards and attendants who attend them, it is very desirable that these patients should be removed. Moreover, as indicated above, their improvement under present conditions is hopeless, yet it is known absolutely that many of them would completely recover and others would materially improve so that they could live long lives of usefulness if they were placed under proper climatic and hygienic conditions, such as I will shortly mention.

It is proper to state here that tuberculosis, being a preventable contagious disease is one that is engaging the attention of sanitarians throughout the world, and that efforts are being made everywhere to prevent the spread of this disease, which causes, it is estimated, 25 per cent of the total death rate of the United States. It appears to be the duty of the Government to do all in its power to aid in this grand movement.

The elimination of this disease from the seafaring classes is especially incumbent upon the Treasury Department and the Marine-Hospital Service. These sailors come to our hospitals and remain a sufficient length of time to leave, if able to leave at all, and to again ship on board their vessels, where, in the narrow confines of the forecabin, they spread the disease among other sailors with whom they are so closely associated. Therefore any effort made to eliminate this disease from among the sailors is a very essential factor in preventing the spread of the disease among all classes of our population.

It is well known that in the southwestern portion of our country there is territory still belonging to the United States Government where the climatic conditions are such that patients afflicted with this disease when removed there will ultimately recover. It is therefore proposed to establish a marine hospital in this section and to remove there from time to time, as can be done most easily and economically, the marine hospital patients afflicted with this disease. This subject has been under consideration and a matter of conversation and of correspondence by myself for a number of years, and in 1878 I broached the subject of a ranch for the treatment of these sailors. A number of articles touching upon the subject are included in the annual reports of the Marine-Hospital Service, contributed by several officers, as follows: One by P. A. Surg. J. O. Cobb on "Incurable tuberculosis cases in the North" in the report for 1803; another by P. A. Surg. W. D. Bratton on "Arid region sanatoriums for the treatment of tuberculosis cases," and recently a report has been received from P. A. Surg. J. O. Cobb going somewhat into details with regard to the proposed sanatoriums. From this last report, a copy of which is inclosed, it will be seen that the cost of maintaining these tuberculosis patients in the Marine-Hospital Service—10 per cent of the number of patients in the hospitals to-day being of this character—is almost as great as would be the cost of transporting and maintaining them in a sanatorium established in Arizona or New Mexico, and that, with proper management and slight necessary legislation, the cost of maintaining them would be much less than at present, and that the sanatorium might, in due course of time, become self-supporting.

In accordance with your letter of November 14, 1898, addressed to the Secretary of the Interior, requesting that all the facilities possible be extended to P. A. Surg. J. O. Cobb, detailed for this investigation, in ascertaining what abandoned military reservations or other public lands are now available in the arid regions of Arizona and New Mexico, Dr. Cobb has completed this inquiry, the results of which are embodied in the inclosed report. From this report it will be seen that there

are a number of available reservations well located near railroads, with abundant water supply and good grounds for grazing and gardening, which, by Presidential order, can be turned over to the Treasury Department for the purpose mentioned. I believe that there will be no legal objection to at once establishing such a sanatorium, and the funds are sufficient. Before further action, however, it is necessary to determine which of the reservations reported on by Dr. Cobb is most available, and I have, therefore, to recommend that I be authorized to detail him for the purpose of making a personal inspection of the places named in his report, and of such other places as may be suggested to him en route. It is believed that Dr. Cobb can complete this tour within three or four weeks, and upon receiving his report I will bring the matter again to your attention.

Respectfully, yours,

WALTER WYMAN,

Supervising Surgeon-General M. H. S.

The SECRETARY OF THE TREASURY.

TREASURY DEPARTMENT,

Washington, March 6, 1899.

SIR: I beg leave to invite your attention to letter from this Department, dated November 14, 1898, relating to the proposed establishment by the Marine-Hospital Service of a sanatorium in the arid region of New Mexico for the treatment of consumptive patients, and requesting that assistance be given to an officer detailed by the Surgeon-General to make examination of the most desirable sites still in possession of the Government.

I am informed by the Surgeon-General that, in a personal interview with your predecessor, the measure was fully explained and the transfer of one of the sites under jurisdiction of your Department met with his approval. A complete examination of all the available reservations has been made by the officer above referred to, and the abandoned military reservation known as the Fort Stanton Reservation has been determined upon as the one offering facilities superior in every respect to any other.

As shown in the reports of the Surgeon-General of the Marine-Hospital Service, this Department has had under consideration for a period of three years the establishment of a tuberculosis sanatorium in New Mexico, but for financial and other reasons definite action has not been possible until the present time. The measure, however, has been carefully considered and nearly all preliminary steps perfected. Its importance in its effect, not only upon the patients of the Marine-Hospital Service, but also as affecting the public health in aiding in the suppression of this contagious disease, can scarcely be overestimated.

I have, therefore, to request that such action be taken as will give the control of said reservation in whole, and the buildings thereon, to this Department for use by the Marine-Hospital Service, as above indicated.

I have the honor to remain, respectfully, yours,

L. J. GAGE, *Secretary.*

The SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,

Washington, April 3, 1899.

SIR: I have the honor to acknowledge the receipt of your letter of the 6th ultimo, wherein you requested that action be taken to give control of the Fort Stanton

abandoned military reservation, N. Mex., with the buildings thereon, to the Treasury Department, for use by the Marine-Hospital Service for the establishment of a sanatorium for the treatment of consumptive patients.

In compliance with your request, I have procured an Executive order, dated April 1, 1899, reserving and setting apart the reservation for the use of the Marine-Hospital Service.

I inclose herewith a copy of the order for your full information.

Very respectfully,

E. A. HITCHCOCK, *Secretary.*

The SECRETARY OF THE TREASURY.

EXECUTIVE MANSION, *April 1, 1899.*

It is hereby ordered that the Fort Stanton abandoned military reservation, N. Mex., containing 10,240 acres, more or less, with the buildings thereon, be, and it is hereby, reserved and set apart for the use of the Marine-Hospital Service.

Excepting that the force and effect of this order shall not apply to any lands to which, prior to the date hereof, valid claims may have attached under the homestead or mineral-land laws.

WILLIAM MCKINLEY.

TREASURY DEPARTMENT,

Washington, April 20, 1899.

SIR: Referring to Executive order of April 1, 1899, a copy of which was inclosed with your letter of April 3, 1899, to this Department, I have to request that the custodian in charge of the Fort Stanton Military Reservation be directed to turn over the same to P. A. Surg. J. O. Cobb, Marine-Hospital Service, who has been directed to proceed to Fort Stanton to take charge of the station.

I have the honor to remain, respectfully, yours,

L. J. GAGE, *Secretary.*

The SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,

Washington, April 24, 1899.

SIR: I have the honor to acknowledge the receipt of your letter of the 20th instant, wherein you have requested that the custodian of the Fort Stanton abandoned military reservation, N. Mex., which, by Executive order of April 1, 1899, was reserved for the use of the Marine-Hospital Service, be directed to turn over the reservation to P. A. Surg. J. O. Cobb, Marine-Hospital Service, who has been directed to take charge of the station.

In answer you are advised that, in accordance with your request, I have to-day directed the Commissioner of the General Land Office to instruct the custodian to relinquish control of the reservation to P. A. Surgeon Cobb when he shall present himself to accept such control.

Very respectfully,

E. A. HITCHCOCK, *Secretary.*

The SECRETARY OF THE TREASURY.

ADMINISTRATIVE DETAILS, CIRCULARS, CIRCULAR LETTERS, ETC.

CIRCULAR LETTER RELATIVE TO TREATMENT OF TUBERCULOUS PATIENTS IN SEPARATE WARDS.

TREASURY DEPARTMENT,

OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.

*Washington, D. C., August 2, 1898.**To Medical Officers in Command of United States Marine Hospitals:*

You are informed that, in the opinion of the Bureau, it is a matter of great importance to treat tuberculous patients in wards separate from those in which nontuberculous patients are treated.

If it is possible in the hospital under your command to set apart a ward for tuberculous patients exclusively, you are hereby directed to do so. If this is not possible, you are directed to report the alterations or additions necessary, in order that it may be done.

WALTER WYMAN,

Supervising Surgeon-General, M. H. S.

Replies from medical officers in command of marine hospitals were received as follows:

Baltimore.—This class of patients has been isolated from the nontuberculous patients in a separate ward at this hospital for the past eighteen months.

Boston.—These patients have been treated in a separate ward at this hospital for the past fifteen years.

Cairo.—There are no separate wards that can be set aside at this station for tuberculous cases, and I would respectfully recommend for this purpose the construction of a new ward.

Chicago.—A separate ward was set apart for the exclusive use of said patients at this hospital in the spring of 1898.

Cincinnati.—There being but two large wards in the hospital at Cincinnati, used, respectively, for white and colored patients, it has not been practicable to isolate tuberculous patients, but they are separated by an interval of from 40 to 60 feet, the portion allotted to them being screened from the rest.

Cleveland.—A ward was prepared for the reception of tuberculous patients exclusively, which was opened November 10, 1898, and all such cases have been isolated therein since that date. The ward is well lighted and heated.

Detroit.—A ward has been set apart for the exclusive use of tuberculous patients.

Delaware Breakwater.—It is not practicable to isolate tuberculous patients at this station, and the number is too small to warrant making alterations to secure such isolation.

Evanston.—It is not possible to set apart a ward for tuberculous patients at this station. There are two wards, one for whites and one for colored, and I do not think it advisable to mix them.

Key West.—It has been the custom at this hospital for the last two years to isolate the tuberculous patients as far as practicable. The erection recently of the Ducker Hospital will render the separation of tuberculous patients always possible.

Louisville.—There is not any room here that can be set aside for the purpose indicated, an additional compartment or building being necessary for the isolated treatment of tuberculous patients.

Memphis.—A small ward, formerly used for white patients, is available for the purpose of isolating tuberculous cases.

Mobile.—The limited space and crowded condition of this hospital render it impossible to set aside a separate place for tuberculous patients. The only remedy that I consider the most feasible is the building of an additional wing to the present

structure or the erection of a suitable residence for the officers, thus giving the entire building to executive and hospital purposes.

New York.—The tuberculous patients in this hospital have been transferred from other wards to Ward C, on the third floor, north end.

Portland.—The question of isolating tuberculous cases has been under consideration at this hospital for some time, and attempt has been made to separate tuberculous patients from other cases, but, owing to the limited accommodations, it has not always been possible to do so. It is recommended that the westerly ward, second floor, be divided in two by a partition across the middle, thus giving a separate ward for such cases.

San Francisco.—There is sufficient ward capacity at this station to allow isolation, provided the repairs and improvements recommended by this office in letter of October 7, 1897, can be completed, and for some of which, I understand, appropriation has already been made by Congress.

St. Louis.—All white patients suffering from tuberculosis have been moved into the north ward, which has hitherto been unoccupied. There is no separate ward for the colored patients, so I have arranged to have them placed by themselves in the small room of the south ward, which is used for colored patients.

Vineyard Haven.—It has been the custom at this station for more than two years past to isolate these cases, and all such patients have been placed in a ward by themselves.

Wilmington.—There is a separate building, consisting of one ward, built especially for contagious diseases, in which we place all patients suffering from tuberculosis. This ward will hold twelve patients.

Port Townsend, Wash.—Tuberculous patients have not been treated in separate wards in this hospital, nor do I believe it possible to do so without the construction of an addition to the building. The number of cases of tuberculous disease under treatment here is never large, the average is 4 or 5.

INSTRUCTIONS RELATIVE TO DIAGNOSIS OF SMALLPOX.

[Circular letter.]

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,

Washington, D. C., January 12, 1899.

In view of the relation which officers of the Marine-Hospital Service sustain toward the public health and the duties conferred upon them by law in connection with the management of quarantines against contagious and infectious diseases, it is a matter of great importance that they should be able to diagnose contagious diseases with accuracy, and particularly the widely prevalent disease smallpox, especially in its earlier stages.

As your reply to Bureau circular letter of April 27, 1898, indicates that you have not had sufficient practical experience with smallpox to enable you to diagnose the disease with confidence, you are directed, upon the appearance of smallpox at or in the vicinity of your station, to report the fact to the Bureau, when travel orders will be given you, if circumstances permit, to visit the infected locality with a view to seeing the cases and becoming familiar with the diagnosis of the disease in all its stages. In the meantime you will use every endeavor as opportunity offers to familiarize yourself with this and other contagious and infectious diseases, taking due care, however, to avoid becoming yourself a carrier of contagion.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General M. H. S.

VACCINATION OF CREWS.

[Copy of letter sent to all medical officers in command of marine-hospital stations.]

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., May 4, 1899.

SIR: In view of the prevalence of smallpox in certain ports, it is deemed wise to have the crews of vessels vaccinated as far as practicable. You are directed to make requisition for a sufficient supply of vaccine virus to vaccinate the crews of vessels at your port. While the vaccination can not be made compulsory, you will use every endeavor to persuade the officers and crews to submit to vaccination, either at the marine-hospital office or on board the vessel, as may be most convenient. Make a weekly report, giving the total number of vaccinations during the week. Give the names of vessels visited for this purpose, and the number of the crew on each.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

CIRCULAR LETTER RELATIVE TO MARKING HOSPITAL FURNITURE.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.
Washington, D. C., March 25, 1899.

To Medical Officers in Command of Stations of the First Class, United States Marine-Hospital Service:

In furtherance of the provisions of paragraph 99, Regulations, Marine-Hospital Service, 1897, which provides that articles of furniture, when purchased for and assigned to the specified quarters of the commissioned officer, shall not be changed to other quarters, medical officers in command of stations of the first class are hereby directed to mark all such articles of parlor, bedroom, dining-room, and hall furniture now in the several quarters of commissioned officers at their stations. The articles of furniture shall be marked "Surgeon's quarters," "Passed assistant surgeon's quarters," or "Assistant surgeon's quarters," as the case may be, with date of purchase. Pieces of furniture shall be marked on the under surfaces, where the marks will be least observable, and carpets on the under face. Articles of furniture purchased hereafter shall be marked in this manner when received. The provisions of this circular do not apply to small articles chargeable to the appropriation "Furniture and repairs of furniture" which can not be permanently marked.

The materials necessary to carry out the provisions of this circular will be furnished on requisition.

You are directed to acknowledge receipt of this circular.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

CIRCULAR LETTER RELATIVE TO PROPER USE OF BEDSIDE TABLES.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., March 30, 1899.

To Medical Officers in Command of Stations of the First Class, United States Marine-Hospital Service:

It appears from reports of inspections of stations of the first class, made from time to time, that the bedside tables in the wards are still used in the various hos-

pitals as a general receptacle for all kinds of articles belonging to patients, and that in consequence they present a generally untidy appearance. When the old box style of bedside stand was superseded by the present enameled iron and glass bedside table, it was done with the intention of securing better conditions in the ward, both from a hygienic standpoint as well as for improving its general appearance. These bedside tables were intended to contain only necessary ward articles, such as towels, medicines, medicine glasses, and a drinking cup for each patient, and not as receptacles for clothing, smoking articles, and other collections which sailors accumulate. Proper compartments must be provided for the clothing of patients not in daily use, and the bedside tables be devoted to the proper uses above indicated. Compartments for smoking articles should be arranged for in the smoking rooms, with due precaution against fire, and arrangements also should be made for reading matter in its proper place.

WALTER WYMAN,
Surgeon-General M. H. S.

CIRCULAR LETTER DIRECTING COPIES MADE OF CORRESPONDENCE.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., April 29, 1899.

To Medical Officers of the Marine-Hospital Service on Maritime Quarantine Duty either in the United States, Cuba, Porto Rico, or elsewhere:

In the discharge of your maritime quarantine functions the Bureau is aware that occasionally correspondence is conducted between the officers in charge of State and local quarantines or officers of State boards of health and yourselves. The Bureau is aware that this correspondence is at times necessary, and assents thereto in so far as it relates to details covered by the regulations or instructions from the Bureau and not affecting new procedures or the general policy of the Bureau or Department. Occasionally, however, correspondence is conducted which the Bureau learns of through others than its own officers and containing information which would have been valuable here. It is therefore ordered that copies of such correspondence as may be held, as indicated above, unless of trivial importance, shall be immediately forwarded to the Bureau for its information.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

RELIEF OF SICK, DISABLED, OR DESTITUTE SEAMEN IN CUBAN PORTS.

TREASURY DEPARTMENT,
Washington, August 2, 1899.

SIR: I am informed by the Supervising Surgeon-General of the Marine-Hospital Service that applications for relief are being made to the officers of the Marine-Hospital Service detailed as quarantine officers in ports of Cuba by sick and disabled seamen employed on documented vessels of the United States. Such seamen were formerly cared for by the American consuls stationed at the ports of Cuba, but as there are now no such officers in Cuba, and as the Marine-Hospital Service has no provisions in any foreign territory for the care of such seamen, they are, when sick or destitute, thrown upon their own resources.

I therefore request to be informed whether the appropriation "for relief and protection of American seamen in foreign countries" is not available for the care of sick, disabled, or destitute seamen in the ports of Cuba through the collectors of customs who are performing the duties formerly devolving upon consular officers.

Respectfully, yours,

L. J. GAGE, *Secretary.*

The SECRETARY OF STATE.

DEPARTMENT OF STATE,

Washington, August 11, 1899.

SIR: I have the honor, by direction of the Secretary of State, to acknowledge the receipt of your letter of the 2d instant, wherein you say that the Supervising Surgeon-General of the Marine-Hospital Service states that applications for relief have been made to the officers of that Service detailed as quarantine officers in ports of Cuba by sick and disabled seamen employed on documented vessels of the United States. You accordingly inquire whether the appropriation for "relief and protection of American seamen in foreign countries" is not available for the care of sick, disabled, or destitute seamen in the ports of Cuba through the collectors of customs, who are performing the duties formerly devolving upon consular officers.

In circular No. 16, issued by the War Department (Division of Customs and Insular Affairs), dated May 11, 1899, relating to Cuba, there is a constant reference to the "occupation of Cuba for the protection of life and property" and to "territory under military government." The understanding of this Department is that within the meaning of the act of Congress Cuba is a "foreign country" whose government is being administered by the military authorities of the United States. The circular referred to directs collectors of customs to perform the duties formerly belonging to United States consuls or consular officers at ports in territory under military government, so far as concerns seamen, vessels, clearances, etc.

In the opinion of the Department, therefore, the appropriation for "relief and protection of American seamen in foreign countries" can be properly applied to the care of sick, disabled, or destitute seamen in the ports of Cuba.

I have the honor to be, sir, your obedient servant,

THOS. W. CRIDLER,
Third Assistant Secretary.

THE SECRETARY OF THE TREASURY.

AMENDMENT TO REGULATIONS, UNITED STATES MARINE-HOSPITAL SERVICE, 1897.

TREASURY DEPARTMENT.

OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,

Washington, D. C., February 11, 1899.

To Commissioned Officers, Acting Assistant Surgeons, and others concerned:

Paragraph 381 of the Revised Regulations for the Government of the United States Marine-Hospital Service, approved November 29, 1897, is hereby amended so that it shall read as follows:

"During the season when navigation is closed at any port, by reason of ice or low water, seamen applying for relief at such ports shall be entitled to same, provided they present the documentary evidence required in paragraph 375, which must show that the applicants were employed within sixty days immediately preceding the said closure of navigation, and it must be satisfactorily shown that the disease or injury is not the result of employment on shore nor the result of vicious habits."

This amendment will be entered in the official copy of the Regulations at each station by the officer in charge, as required by the letter of promulgation, page 3, Regulations, Marine-Hospital Service.

WALTER WYMAN,
Supervising Surgeon-General U. S. M. H. S.

Approved.

O. L. SPAULDING,

Acting Secretary of the Treasury.

Approved.

WILLIAM MCKINLEY.

RULES GOVERNING THE ELIGIBILITY OF NAVAL GRADUATES TO THE UNITED STATES REVENUE-CUTTER SERVICE.

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, D. C., April 1, 1899.

The following rules governing the eligibility of graduates of the United States Naval Academy to the position of third lieutenant in the United States Revenue-Cutter Service are hereby promulgated for the information of all concerned:

* * * * *

4. Each candidate shall undergo a rigid examination by a board of medical officers of the Marine-Hospital Service to determine his physical fitness for the position.

* * * * *

L. J. GAGE, *Secretary.*

Approved.

WILLIAM MCKINLEY.

CORRESPONDENCE RELATIVE TO FORGED MASTER'S CERTIFICATE.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
Port of Boston, Mass., January 9, 1899.

SIR: I have to report that on January 6, 1899, Seaman James Aspell was examined before the United States commissioner at this port, on a warrant sworn out by myself, charging him with obtaining admission to the hospital on a forged certificate. The evidence being considered sufficient, he was held for the grand jury on \$500 bail. No bond being forthcoming, he was sent to jail until March 21, when his trial will take place.

Respectfully, yours,

FAIRFAX IRWIN,
Surgeon, M. H. S.

SUPERVISING SURGEON-GENERAL MARINE-HOSPITAL SERVICE,
Washington, D. C.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
Port of Boston, Mass., March 24, 1899.

SIR: Referring to my letter of January 9, relative to the case of James Aspell, who secured admission to this hospital on a forged master's certificate, and who was held for trial by the United States commissioner I have now to report that Aspell appeared for trial before the United States court on March 21, pleaded guilty, and was sentenced to the East Cambridge House of Correction for two years.

Respectfully, yours,

FAIRFAX IRWIN,
Surgeon, M. H. S.

SUPERVISING SURGEON-GENERAL MARINE-HOSPITAL SERVICE,
Washington, D. C.

REPORT OF THE PURVEYING DIVISION.

During the present fiscal year there were 643 requisitions for medical and other supplies filled, to meet the needs of marine hospitals and relief stations of the Service.

Twelve national quarantine stations, several detention camps, and

the immigrant hospital at New York (under the control of the Immigration Service) have also received their supplies in whole or in part through this division.

The labor involved in purveying this material is shown by the number of packages shipped, 5,133, and their total weight, 320,748 pounds.

Regarding the pharmaceutical work of this division, the anticipated removal of the purveying depot to New York limited the manufacture of pharmaceutical preparations to the immediate demands, and because of this the total output was somewhat less than in previous years, and may be divided as follows:

	Grams.
Elixirs	1,459,760
Fluid extracts	531,500
Medicated waters	7,000
Liniments	540,000
Spirits	216,100
Miscellaneous	140,500
Syrups	1,381,500
Tinctures	869,250
Medicated wines	55,000
Total (of which there were 79 different kinds)	5,200,610

The following is a summary of the cost of various supplies purchased for issue during the year:

Medical supplies	\$15,968.29
Hospital stores	9,825.74
Hospital sundries and laboratory supplies	19,144.01
Surgical instruments and appliances	13,743.46
Bedding, clothing, etc	15,438.40
Medical books and journals	7,491.72
Total	81,611.62

In addition to the above, the purveying division furnished to the different stations, through orders on contractors for direct shipment, a large quantity of supplies, such as operating-room furniture, scientific apparatus, clinical record cases, etc.

There has also been furnished to the marine hospitals, as well as the quarantine stations, improved steam disinfecting apparatus with formaldehyde attachment, by means of which clothing and bedding of patients suffering with contagious or infectious diseases can be rendered noninfectious.

In order to have uniformity, and to insure their durability, drawings and specifications were prepared and approved for a Service ambulance. Fifteen of these vehicles have been manufactured and, after inspection, furnished to the several hospitals requiring the same.

REMOVAL OF THE PURVEYING DIVISION TO NEW YORK CITY.

Toward the close of the fiscal year the plan for the removal of the purveying division from this Bureau and its establishment in New York City was consummated. The officer in charge of it spent considerable time in obtaining a suitable location, and in the latter part of May a building, then in course of construction, No. 378 Washington street, on the southwest corner of Beach, was secured, and a formal lease of same at an annual rental of \$7,000, with the privilege of renewal on the part of Government for a period of ten years, was completed, to take effect June 1.

The building is six stories in height, with a basement, having a frontage of 25 feet on Washington street and 75 feet on Beach street, with a superficial floor space of 13,000 square feet, exclusive of stairway and elevator shaft. The building is provided with an electric power elevator, heated by steam, and lighted by electricity.

The executive officers have been located on the fifth floor in apartments provided by the owner, and the sixth floor is arranged for the use of boards of medical officers convened for examining applicants for admission to the Service and for other purposes of a like character.

At the close of the fiscal year the interior of the building was entirely finished and ready for occupancy, and, with a view to reducing the labor of removal of the stock of supplies on hand in the Bureau, the various stations were directed to make special requisitions for the ensuing six months in order to accomplish this end. The remaining supplies on hand were then packed and prepared for shipment. At the close of the fiscal year the purveying depot had not been installed in its new quarters, but the work was making satisfactory progress.

The situation of the purveying depot is in the immediate neighborhood of all the great shipping lines, both railway and steam, and within a short distance of the army medical supply depot, thus facilitating the shipment of supplies more readily in cases of emergency and reducing the cost of transportation.

The purveying depot is under the command of an experienced officer of the Service, who, with an efficient force, is able to furnish the different marine hospitals with medical and surgical supplies more satisfactorily and with less delay than when the purveying division was in the Bureau, thus demonstrating the wisdom of its removal, not only on account of the better facilities for obtaining supplies, but also for their more ready shipment.

The following is the correspondence relating to this transfer:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,

Washington, D. C., February 7, 1899.

SIR: Referring to your order of the 28th ultimo, directing me to proceed to New York on business connected with the purveying division and to inspect the Service

at that port during my stay in that city, I have the honor to submit the following statement:

The business referred to, connected with the division under my charge, related to examination of buildings which might be suitable for installing the purveying division in New York, the inspection of certain operating-room furniture now being constructed for various hospitals of the Service, consultation with the contractors in respect to orders issued recently, and consultation with carriage builders respecting Service ambulance.

The special business connected with the examination of buildings suitable for the work of the purveying division in that city was first undertaken, and interviews with real-estate dealers having business property for disposal in the lower part of New York City, which was considered to be the most desirable locality, and the inspection of properties offered by them took up a large portion of the time which I felt to be at my disposal. I examined in all 28 pieces of property, the rental of which ranged from \$2,000 a year to \$7,200 a year. The object of the search was to secure a location in proximity to the Army Building, where the depot quartermaster is located and with whom we have extensive business dealings in the matter of transportation. The character of these buildings ranged from the ordinary unfinished warehouse, with uncovered brick partition walls and rough, heavy flooring, without heat, light, or water, to the ordinary office structure having these modern conveniences and usually a freight elevator. It will not be necessary to enumerate the special places visited, as many of them are quite unsuited to the purpose from one cause or another, some being too small, others having insufficient light, or without shipping facilities back or front. As a result of my investigations I came to the conclusion that there are two methods open which would answer the purposes desired:

1. To secure an improved office building of four or five stories, fitted with heating, hoisting, and lighting facilities, at a rental of from \$3,500 to \$4,500 per annum. Such a building is represented by a piece of property facing Pearl and Bridge streets, between State and Whitehall streets, adjoining the Chesebrough Building and a part of that property. I inclose a plan of the building, which consists of a basement and four stories, and which has been verbally offered for our purpose at a rental of \$5,000 per annum. This price I believe to be a nominal statement made for the purpose of opening negotiations, and it is my opinion that if the location is considered desirable, as in my opinion it is, the owners would consider a less but reasonable price for the same. It is now occupied as offices, part of which are Government offices, and is heated by steam, lighted by gas, and the owners will put in a power elevator. The price stated includes the use of these improvements, except the usual charges for gas and water used.

2. The other plan of meeting the conditions desired is by the rental of a storage warehouse, without modern improvements, and making such necessary internal fittings as the nature of the division requires, which must include a heating apparatus and an elevator. The offices necessary to be connected with the management of the division under these circumstances would be located in close proximity in some adjoining or near-by office building, offering comfortable and convenient room for the executive staff, such as could not be secured in a storage warehouse. This plan would possibly be less expensive, the warehouse probably costing \$1,800 per annum and the offices \$1,000 per annum, making a total of \$2,800 per annum, to which must be added the cost of heating and hoisting apparatus.

Properties in New York usually become available on May 1, which is the time when leases and rentals are renewed. This feature brings up the feature of leasing, which is an important element in the matter, as all agents are desirous of renting for a fixed term of years under the usual form of lease.

I inspected the surgical operating-room furniture in process of construction and

visited carriage manufacturers in connection with the proposed Service ambulance, but I was unable in the limited time to make an inspection of the Service at New York, which I considered as less pressing than the other matters mentioned.

Respectfully, yours,

CHAS. E. BANKS,
Surgeon, M. H. S.

SURGEON-GENERAL UNITED STATES MARINE-HOSPITAL SERVICE.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., April 27, 1899.

SIR: Referring to my letter of August 3, 1898, in which I recommended the removal of the purveying division to New York. I have the honor to submit the following detailed explanation of the general reasons which I offered in support of the proposition:

First. In respect to the local business market, I stated that it was not a manufacturing center; its business interests are almost wholly confined to retail establishments, as the conditions of the locality do not demand larger wholesale supply houses. As a consequence, we are unable to reach directly dealers in goods at first hand. Those who, by reason of proximity and personal knowledge of Department business, are able to submit proposals for supplies are "middlemen" and professional "Government contractors," whose profit must be added to the cost of the goods delivered to the Service. As they are not actual dealers in the various articles which they supply, the method of obtaining redress for goods delivered below standard is unsatisfactory and tedious. Another class of contractors is the retail merchant, who does not keep in stock a sufficient quantity of supplies under contract to meet emergency orders and embarrassing delays result therefrom. These small contractors purchase goods wherever they can from various sources, and thus uniformity is not obtained, and when an emergency arises this essential condition must be waived to meet a sudden demand and it is entirely unsatisfactory. Dealing direct with wholesale houses would result in saving one profit on a large amount of supplies.

Second. In respect to the transportation facilities, I stated that it was not a railroad center. Washington is what is known as a "local" freight point and not a "terminal," and rates are made accordingly higher than for through freight. It has no foreign commerce or harbor, and, sending out but little freight, it has none of the facility of a "terminal."

Rapid movement of freight from this point can not be obtained with certainty, as through freight trains are not made up at this place. As an example, I would state that through freight from St. Louis to New York is cheaper than delivered in Washington, although the trains may pass through this city to New York. Considerable amount would be saved in freight charges as a consequence.

Third. In the shipment of the emergency supplies, such as disinfectants for quarantine stations, a day's delay at least by express and longer by freight would be obviated if the purveying division were located in New York. As much of this supply comes from there, it is necessary to send orders to the dealers at that point, often through "middlemen" in this city, with the resulting delay in dispatch. With sufficient storage room all these articles would be kept on hand and orders from the Bureau filled within a few hours. This condition is not possible in the present quarters on account of lack of room.

Fourth. With additional commercial facilities, as stated in my letter, "additional classes of hospital supplies could be stored, such as kitchen and hospital utensils and subsistence stores, which are now purchased in small quantities at

each station at retail prices." This measure would also result in an economical administration, an improvement in the quality of goods purchased in quantity, and insure a uniformity of supplies for each station.

The inspection of goods thus purchased would be a check upon attempts to deliver material below the required standard, as exists under present circumstances, and, in my judgment, would be an important economical measure, which would entirely justify itself in considering the first cost of removal and rental.

Careful consideration of the subject since my letter to you, above referred to, has only confirmed my views that it is only a sound business proposition to make the transfer recommended.

Respectfully, yours,

CHAS. E. BANKS,
Surgeon, M. H. S.

SURGEON-GENERAL UNITED STATES MARINE-HOSPITAL SERVICE.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., May 16, 1899.

SIR: In compliance with your order of the 27th ultimo, directing me to proceed to New York to examine available buildings which would be suitable for the installation of the purveying division in that city, and further directing me to examine such buildings owned by the Government as might have space for such purpose, I have the honor to report that I arrived in New York on the 5th instant, and, after inspecting the Service at that port and completing same on the 9th instant, I devoted the remainder of my stay in that city till noon of the 13th instant to the work of examining buildings. As a result of my investigations I secured a proposal from the owner of a building on the corner of Beach and Washington streets, which proposal I forwarded to you under date of the 13th instant.

In respect to the general subject I would say that having for the second time made this investigation, I found that available locations were scarcer than in the early part of the year. Improved trade conditions have favored the letting of buildings, and it was not without difficulty that I was able to obtain the proposal above referred to.

With respect to existing public buildings which might be available for the purpose, I found that the existing buildings belonging to the United States are the post-office, custom-house, appraiser's warehouse, barge office, and various public storehouses situated in different portions of the city. The post-office is not to be considered, as it is entirely occupied. The custom-house is soon to be torn down and a new one built. The appraiser's warehouse is fully occupied at the present time, and the same is to be said of the barge office, which is now in use by the United States Immigration Service. It will not be vacated by them for a year or more, and it would require extensive remodeling to meet the necessities of the purveying division. The various storehouses in various portions of the city are either remote from the desirable locations, or are plain warehouses without heating, lighting, or hoisting apparatus, which are essentials for our use, and used only for the storage of goods. Any joint occupancy of a building with another branch of the Government service would be undesirable with this Service as a subtenant. It has never proven a satisfactory condition, and I would not recommend that the experiment be tried for the purpose of installing this division in another city. I believe that the best conditions could be obtained by independent occupation of a building in which this Service is its own master, and not subjected to the conveniences of another service owning or in control of the premises.

The building which is offered to the Service by the proposal forwarded in my letter of the 13th instant is now under construction and about completed. It is admirably adapted for the purpose, with all modern improvements for heating, hoisting, and ventilating, and has the distinct advantage of having been heretofore unoccupied. After examination of a number of old buildings I came to the conclusion that extensive alterations would have to be made at the expense either of the owner or the Service to fit them interiorly for the purposes of the purveying division. In either case the expense would fall on the Service, as rental or actual outlay, and at the best the result would be an old building for which increased rent would be demanded by reason of the improvements. The situation of this building, on the corner of Beach and Washington streets, is most favorable from the standpoint of transportation facilities. It is within one block of the North River and the Pennsylvania freight depot, and two blocks from the New York Central and Hudson River Railroad freight depot. It is also within one block of the medical supply depot, United States Army.

This location was selected by the officers in charge of that depot for the reasons just stated. There will be a reciprocal advantage in this proximity for the two depots. I am sure, from conversations with persons in whose judgment I have confidence, that the rental of this property is a reasonable one in view of existing business conditions, and especially from the fact of its being a new building, which certainly adds to its desirability for our purposes. It is especially fortunate in having ample light on two sides for five stories, and on four sides for the top story, conditions which could not be obtained in a building situated in the middle of a block. The rental asked by the proprietor at first was \$8,500, but, on the assurance of probable permanency, I secured his tender of \$7,000 per annum for one year, with the privilege of renewal for ten years. These are the terms recently secured by the Medical Department of the Army for their supply depot above mentioned. The owner verbally agreed to make reasonable alterations in the nature of partitions and other fittings interiorly in case a lease is effected. The option will expire at noon of the 23d instant, and I urge early consideration. Pending a final decision correspondence should be had with the owner to more definitely fix some points in connection with the fittings of the building, such as carrying the steam heat to the upper floors, describing conditions as to concreting the basement, and the erection of an awning over the sidewalk to protect shipment of supplies in stormy weather.

Respectfully, yours,

CHAS. E. BANKS,
Surgeon M. H. S.

SURGEON-GENERAL

UNITED STATES MARINE-HOSPITAL SERVICE.

TREASURY DEPARTMENT, MARINE-HOSPITAL SERVICE,

May 18, 1899.

Respectfully referred to the honorable the Secretary of the Treasury, with the statement that in my opinion the transfer of the purveying division to New York, for the reasons herein mentioned, is necessary for the efficient administration of the service.

It is recommended, therefore, that authority be granted for said transfer and for the execution of a lease for the necessary building.

WALTER WYMAN,
Surgeon-General M. H. S.

Approved:

O. L. SPAULDING,
Assistant Secretary.

ADDITIONS AND AMENDMENTS TO THE REGULATIONS, UNITED STATES MARINE-HOSPITAL SERVICE, 1897, FOR THE MANAGEMENT OF THE PURVEYING DEPOT, NEW YORK CITY.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,

Washington, D. C., June 1, 1899.

To Commissioned Officers, Acting Assistant Surgeons, and Others concerned:

The following additions to the revised regulations for the government of the United States Marine-Hospital Service, approved November 29, 1897, are hereby adopted and will be in force on and after June 1, 1899, viz:

ARTICLE XXIX.—*Purveying depot.*

699. The purveying depot established in New York City shall be under the command of a commissioned officer of the Service, whose title shall be, *ex officio*, medical purveyor, and he shall not receive extra compensation therefor.

700. The purveying depot shall be deemed a station of the first class, and all regulations applying to the management of such stations, in so far as they are applicable, shall be observed in the management of the depot.

701. The medical purveyor shall exercise the same authority in its management as officers in command of stations, and shall report direct to the Supervising Surgeon-General.

702. The purveying depot is established as the purchasing and issuing division of the Marine-Hospital Service, and all such supplies for hospital, quarantine, and other relief stations as can be satisfactorily supplied thereto shall be issued from this depot by the medical purveyor upon requisitions approved by the Supervising Surgeon-General.

703. The medical purveyor shall prepare, on the 1st day of June and the 1st day of December of each year, an estimate of supplies necessary to be purchased for issue, and forward same to the Supervising Surgeon-General for approval. Emergency estimates may be submitted at other times, if required by public exigency.

704. Upon the approval of the semiannual and emergency estimates, advertisements for proposals for supplying articles named in said estimates shall be published in accordance with the directions of the Bureau, and schedules shall be furnished dealers in articles enumerated, and the provisions of paragraphs 555 to 565, inclusive, shall be observed in so far as applicable to the requirements of the purveying depot.

705. A comparative schedule of all the proposals received shall be prepared and transmitted to the Supervising Surgeon-General, together with the proposals in duplicate, giving the recommendations of the medical purveyor as to the relative merits of each proposal and specific recommendations as to the acceptance of each item in said proposals.

706. Upon receipt of instructions from the Bureau as to the proposals accepted, the medical purveyor will notify the bidders whose proposals have been accepted, and if he deems it for the best interest of the Service to enter into a contract the provisions of paragraphs 566 to 568, inclusive, shall be observed in respect thereto.

707. The medical purveyor shall keep an accurate and true account of all supplies purchased and of all supplies issued upon approved requisition, using such necessary books of record as will best fulfill the intent of this regulation.

708. He shall render a property return semiannually on the 30th of June and the 31st of December of all supplies received, issued, and remaining on hand on the dates specified.

709. He shall keep on hand a sufficient supply of all articles listed on the supply table to meet the current needs of the Service, and such emergency requisitions as

the exigencies of the Service may require from time to time; but he shall not purchase articles in excess of an estimated year's supply without special authority from the Supervising Surgeon-General.

The following paragraphs of the revised regulations for the government of the Marine-Hospital Service, approved November 29, 1897, are hereby amended as follows:

Paragraph 1. After the word "internes" add the words "hospital steward and chemist" and "hospital steward and assistant chemist."

Paragraph 3. Insert the words "hospital steward and chemist" and "hospital steward and assistant chemist" between the eighth and ninth lines, in order named.

Add the following sections and paragraphs to Article III. after paragraph 56:

HOSPITAL STEWARD AND CHEMIST.

56a. A hospital steward and chemist and a hospital steward as assistant chemist will be detailed by the Supervising Surgeon-General for duty in the purveying depot of the Service at New York. Hospital stewards of the Service only are eligible for these positions by selection.

56b. Hospital stewards detailed for duty at the purveying depot shall be subject to change of station as the exigencies of the Service require.

Add the following sections and paragraphs to Article IV:

HOSPITAL STEWARD AND CHEMIST.

72a. The compensation of the hospital steward and chemist shall be at the following annual rate, viz, \$1,800 per annum; and the compensation of the hospital steward and assistant chemist shall be at the rate of \$1,400 per annum. This compensation is in lieu of all other allowances for quarters, subsistence, fuel, lights, and commutation.

72b. Whenever a hospital steward who is detailed for duty at the purveying depot to fill the offices named in the preceding paragraph shall be thence transferred to another station of the Service, his compensation shall revert to that prescribed for his grade in paragraphs 73 and 74 of these regulations from the date when he is relieved by his successor.

These additions and amendments will be entered in the official copy of the regulations at each station by the officer in charge, as required by the letter of promulgation, page 3, Regulations, Marine-Hospital Service.

WALTER WYMAN,
Supervising Surgeon-General U. S. M. H. S.

Approved.

L. J. GAGE, *Secretary.*

Approved.

WILLIAM MCKINLEY.

FINANCIAL STATEMENT.

FINANCIAL STATEMENT.

RECEIPTS AND EXPENDITURES, UNITED STATES MARINE-HOSPITAL SERVICE, FOR THE FISCAL YEAR ENDED JUNE 30, 1899.

The balance of the marine-hospital fund available at the commencement of the fiscal year was \$514,997.83, and the receipts from all sources \$851,542.60. The expenditures were \$684,516.10.

SUMMARY—MARINE-HOSPITAL FUND.

Balance July 1, 1898	\$514,997.83
Repayment care foreign seamen, etc	15,707.86
Receipts, tonnage tax collected	835,834.74
Total available during fiscal year	1,366,540.43
Expenditures	684,516.10
Balance June 30, 1899	682,024.33

Preventing the spread of epidemic diseases.

Summary of expenditures July 1, 1898, to June 30, 1899:

Balance July 1, 1898	\$457,190.93
Repayment, sale of rations and miscellaneous	1,669.67
Appropriation act, March 3, 1899	100,000.00

Total available	558,860.60
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Expenditures July 1, 1898, to June 30, 1899:

Foreign medical service—

Salaries, traveling expenses, and miscellaneous	\$14,080.67
Sanitary inspection in United States and miscellaneous	54,706.55

Yellow-fever epidemic—Florida, Mississippi, Tennessee, Georgia, Louisiana, and Texas, viz: Salaries, physicians, guards, attendants, traveling expenses, disinfecting chambers, supplies, transportation charges, vaccine, and miscellaneous

164,293.26

Atlanta, Ga.: Salaries, medical officers, disinfectants, etc

1,275.57

Brunswick, Ga.: Roll sulphur

115.45

Montauk Point, N. Y.: Salaries, traveling expenses, and miscellaneous

4,636.58

Scientific investigation yellow fever, Habana, Cuba:

Salaries, traveling expenses, laboratory supplies, and miscellaneous

8,651.19

Foreign quarantine—Honolulu, Cuba, Porto Rico, Mexico, and Central America: Salaries, disinfectants, autoclaves, and miscellaneous

14,815.17

Expenditures July 1, 1898, to June 30, 1899—Continued.

Cape Charles, Fishermans Island: Salaries and miscellaneous

\$281.10

Savannah, Ga., quarantine: Salaries, quarantine tug
Theekla (\$5,000), disinfectants, subsistence supplies, etc

11,008.98

\$273,864.52

Balance July 1, 1899

284,996.08

Statement of appropriations, quarantine service, 1899.

Appropriation July 1, 1898

\$150,000.00

Deficiency appropriation

10,000.00

Repayment care foreign seamen, etc

1,281.57

Total available

161,281.57

Expenditures during the fiscal year

161,279.22

Balance July 1, 1899

2.35

Summary of expenditures, July 1, 1898, to June 30, 1899.

Name of station.	Maintenance of stations, officers' salaries, repairs to vessels, etc.	Medical supplies and miscellaneous.	Total.
Reedy Island	\$20,716.11	\$145.61	\$20,861.72
Delaware Breakwater	11,325.95	28.04	11,353.99
Cape Charles	18,833.40	276.87	19,110.27
Cape Fear	7,104.87	141.89	7,246.76
South Atlantic	12,185.06	66.19	12,251.25
Brunswick	5,147.72	126.43	5,274.15
Gulf	22,485.76	678.62	23,164.38
Tortugas	13,983.44	422.02	14,405.46
San Diego	5,614.97	54.62	5,669.59
San Francisco	29,650.61	147.37	29,797.98
Port Townsend	9,742.18	37.39	9,779.57
Miscellaneous	2,127.05	235.05	2,362.10
Total	158,917.12	2,362.10	161,279.22

Appropriations for marine hospitals, act March 3, 1891.

Mobile, Ala., amount of appropriation

\$1,500

Balance July 1, 1899

1,500

Appropriations for marine hospitals, act July 1, 1898, transferred to Supervising Architect.

Boston, Mass

\$4,350

Chicago, Ill

37,350

Cleveland, Ohio

8,000

Mobile, Ala

5,000

Port Townsend, Wash

1,500

Vineyard Haven, Mass

600

Appropriations for quarantine stations, act August 1, 1888.

Station.	Balance July 1, 1898.	Expenditures, fiscal year.	Balance June 30, 1899.
Cape Charles	\$2,719.18	\$503.70	\$2,215.48
Tortugas	¹ 10,056.22		

¹ Amount carried to new appropriation, act July 1, 1898.

Chesapeake Bay Quarantine Station, act March 3, 1893.

Balance July 1, 1898.....	\$6,935.00
Balance July 1, 1899 (same balance)	6,935.00

Gulf Quarantine Station, acts March 3, 1891, August 5, 1892, and August 18, 1894.

Balance July 1, 1898.....	\$1,347.57
Balance July 1, 1899 (same balance)	1,347.57

Brunswick, Ga., act June 4, 1897.

Balance July 1, 1898.....	\$4.75
Balance July 1, 1899 (same balance)	4.75

South Atlantic Quarantine Station, act June 11, 1896.

Balance July 1, 1898.....	\$768.22
Balance July 1, 1899 (same balance)	768.22

Brunswick, Ga., Quarantine Station, act June 11, 1896.

Balance July 1, 1898.....	\$340.12
Balance July 1, 1899 (same balance)	340.12

Gulf Quarantine Station, act June 11, 1896.

Balance July 1, 1898.....	\$127.46
Balance July 1, 1899 (same balance)	127.46

Port Townsend Quarantine Station, act June 11, 1896.

Balance July 1, 1898.....	\$372.70
Balance July 1, 1899 (same balance)	372.70

Appropriations for quarantine stations, act June 4, 1897.

Delaware Breakwater:

Balance July 1, 1898.....	\$2.00
Balance July 1, 1899 (same balance)	2.00

South Atlantic:

Balance July 1, 1898.....	9,423.50
Expended to June 30, 1899	8,470.48

Balance July 1, 1899.....	953.02
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Tortugas Quarantine:

Balance July 1, 1898.....	9,500.00
Expended to June 30, 1899	9,500.00

Appropriations for quarantine stations, act July 1, 1898.

Reedy Island	\$3,500.00
Expended to June 30, 1899	202.00

Balance July 1, 1899	3,298.00
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Additional expenditure authorized	3,298.00
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Delaware Breakwater.....	3,200.00
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Balance July 1, 1899.....	3,200.00
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Expenditures authorized.....	3,190.75
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Cape Charles, Virginia	800.00
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Expended to June 30, 1899	785.00
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Balance July 1, 1899	15.00
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Cape Fear	\$3,300.00
Expended to June 30, 1899	3,300.00
Brunswic ., Ga	500.00
Expended to June 30, 1899	440.00
Balance July 1, 1899	60.00
Gulf Quarantine:	
Amount of appropriation	14,100.00
Expended to June 30, 1899	1,838.17
Balance July 1, 1899	12,261.83
Expenditures authorized	11,560.54
Tortugas (Key West), Fla.:	
Amount of appropriation	19,056.22
Expended to June 30, 1899	18,944.22
Balance July 1, 1899	112.00
South Atlantic:	
Amount of appropriation	3,100.00
Expended to June 30, 1899	2,699.70
Balance July 1, 1899	400.30
San Diego, Cal.:	
Amount of appropriation	2,600.00
Expended to June 30, 1899	1,600.00
Balance July 1, 1899	1,000.00
Expenditures authorized	982.60
San Francisco, Cal.:	
Amount of appropriation	3,700.00
Balance July 1, 1899	3,700.00
Expenditures authorized	3,313.40
Astoria, Oreg.:	
Amount of appropriation	30,000.00
Expended to June 30, 1899	199.55
Balance July 1, 1899	29,800.45
San Francisco Quarantine, fumigating, steamer:	
Balance July 1, 1898	1,016.32
Balance July 1, 1899	1,016.32
Key West Quarantine, disinfecting machinery:	
Balance July 1, 1898	900.40
Balance July 1, 1899	900.40

REPORTS OF FATAL CASES, WITH NECROPSIES.

REPORTS OF FATAL CASES, WITH NECROPSIES.

INFLUENZA.

CASE I.

Broncho-pneumonia.

J. W., aged 48 years; nativity, Massachusetts; was admitted to the United States Marine Hospital, San Francisco, Cal., January 9, and died January 15, 1899, at 7.30 p. m.

History.—Patient had erysipelas eight years ago and gonorrhea twenty years ago. His present illness began December 31, 1898, with a chill, following which he had fever and much sweating. He has had chilly sensations every day since the onset. Had no appetite and was not able to sleep. Had a cough which was worse at night, and raised a frothy material in considerable quantities. Had no pain in the chest except from coughing, but at night suffered from dyspnoea when coughing. He was a well-developed, well-nourished man, with supraclavicular spaces slightly sunken. On percussion liver dullness was slightly increased upward. On auscultation bubbling râles were heard over the apex of the right lung, and piping and bubbling râles over almost the entire area of the remainder of the lung. Over the apex of the left lung, extending to the fourth rib anteriorly, bronchial respiration could be heard.

The pulse was 120, the respiration 27, and temperature 39.1 on admission. On January 15, at 6 p. m. sick call, the patient was apparently doing very well. At 7.30 p. m. he got out of bed, walked a few feet for a drink of water, returned, and died immediately on lying down again. The treatment was tincture of digitalis, 1 c. c., and fluid extract of squills, 2 c. c., three times daily; cotton jacket applied to the chest, and strychnine sulphate, 0.0022 gram, hypodermically three times daily. Quinine sulphate was administered in 1-gram dose every evening, and abundant food.

Necropsy (nineteen hours after death).—The body is that of a well-developed, well-nourished, white adult male of medium height. No distinguishing marks on the body. Rigor mortis and post-mortem lividity are well marked. The pupils are moderately dilated. Peritoneum is normal. The pericardium is adherent to both visceral pleural surfaces, on its anterior surface, and completely covered by the lung tissue. It contains 10 c. c. of a clear, straw-colored fluid, and the surfaces are smooth. The heart is normal in size. The right auricle and right ventricle contain some fluid blood and clots. The left auricle contains a yellowish, elastic coagulum which branches into the pulmonary artery. The left ventricle is empty. The wall of the right ventricle is thickened; all the other walls normal. The valves are normal. Heart weighs 710 grams. The pleural cavities are empty. The left lung is 510 grams in weight, crepitant, moderately œdematous, and dark-colored. An offensive purulent fluid exudes from the cut bronchi. The right lung weighs 530 grams, is crepitant, and dark-red. The bronchial glands are enlarged but not caseous. A purulent fluid can be squeezed out of the smaller bronchi, and the walls of the bronchi are reddened and thickened. The left kidney is of normal size and its capsule adherent. The cut section is normal and the weight is 205 grams. The right kidney is adherent to under surface of the right

lobe of the liver at its upper border. Its capsule is adherent in two streaks 5 cm. long. It cuts slightly more resistant than normal. The weight is 195 grams. The pancreas is normal in appearance and weighs 65 grams. The spleen is normal in size, but soft, and tears readily. Its weight is 150 grams. The liver is normal in size and position, color normal, and weight 2,050 grams. The intestines are normal in appearance. The lumen of the appendix vermiformis is occluded. The bladder contains 150 c. c. of a clear, yellow fluid. The walls are thickened and the mucous membrane pale. The dura mater and pia mater are adherent along the great longitudinal sinus in patches, and bands of adhesion go from one side to the other. The vessels of the pia mater are turgid, and that membrane is œdematous. The brain substance is normal on section. The lateral and third ventricles are filled by a clear, yellowish fluid. The brain weighs 1,470 grams.

L. H. H.

T. B. P.

J. M. G.

CEREBRO-SPINAL FEVER.

CASE I.

J. H. M., aged 20; nativity, Virginia; was taken with a chill on December 8, 1898, and admitted to St. Vincent de Paul Hospital, Norfolk, Va., 3.30 p. m., December 11, 1898. Complained of intense pain in head and region of spine. Tenderness along spine; opisthotonus; delirious; photophobia; pupils slightly contracted, but responded to light. Temperature, 39.8; pulse, 108; respiration, 28. Irregular movements and restless, but no convulsions. Treatment. Quinine sulphate, strychnine sulphate, codeine, ice cap to head and spine. Milk diet.

December 12.—Acetanilid and codeine given with bromide of sodium, hydrobromate of quinine, and strychnine sulphate. On account of extreme pain, morphine sulphate hypodermically and hyoscyne hydrobromate. Patient gradually grew worse, delirium increased, pupils dilated; axillary temperature, 39.7. There were no convulsions. Patient died 3 a. m., December 15, 1898.

Necropsy (five hours after death).—Body well nourished. Rigor mortis well marked and muscles very prominent, especially those of neck. There were a few ecchymoses on conjunctivæ and various parts of body. Thorax: Right pleura contained a few adhesions. Lower lobes of both lungs slightly œdematous and congested. Heart normal; contained ante-mortem clots. Abdominal cavity: Liver considerably enlarged and light in color; contained no abscesses. Spine slightly enlarged and much congested. Stomach and intestines normal. Pancreas normal. Kidneys normal; markings very distinct. Pelvis: Bladder, ureters, seminal vesicles, and rectum normal. Brain: Much congested; dura slightly adherent. Thick creamy pus found, especially around cord extending around medulla and pons to base of brain; pus extended up course of blood vessels and along sulci under arachnoid membrane. Since the death of this patient I learn that his brother died last year of the same trouble, and I am told also by the physician who attended him that there was no tubercular history.

E. E. F.

ENTERIC FEVER.

CASE I.

J. J. (colored), aged 18; nativity, Kentucky; admitted into United States Marine Hospital, Cincinnati, Ohio, July 8, 1898, died July 13, 1898.

Clinical history.—Patient was first admitted for measles, June 22, and on July 1 was convalescent. On July 3 patient's temperature rose to 40° C. Complained of severe headache, anorexia, and general malaise. Physical examination revealed

slight tenderness in right iliac fossæ; spleen enlarged; no rose spots; stools frequent, watery, and greenish in color. Temperature continued high, with a morning remission of a degree to a degree and a half. Patient was discharged July 7 as recovered from measles and readmitted July 8 for enteric fever. Hydrotherapy and coal-tar products failed to reduce temperature to any appreciable extent, and from delirium he lapsed into a state of coma, in which condition he died July 13, at 1.10 a. m.

Necropsy (nine hours after death).—Post-mortem rigidity well marked. Brain: Weight, 1,589 grams; marked congestion of all the vessels; increased amount of fluid in arachnoid spaces. Lungs: Weight, 288 grams; left lower lobe in state of hypostatic congestion; right lower lobe in same condition as left; weight, 304 grams. Spleen enlarged; weight, 352 grams. Liver showed evidence of cloudy swelling; weight, 1,696 grams. Intestines: Ulcerated condition throughout ileum; hyperplasia of agminated follicles. Mesenteric glands greatly enlarged. Kidneys normal; weight, right, 144 grams; left, 160 grams.

J. W. S.

C. B. R.

CASE II.

Pneumonia.

F. C., aged 22 years; nativity, Sweden; male, white, single. Admitted to the United States Marine Hospital, Boston, Mass., February 3, 1899. The following history was obtained: He had been sick for a month; he felt sore all over, but especially in the head and chest; he had a slight cough, but no pain upon inspiration; he had had diarrhea for several days. The physical examination showed sonorous râles over the left lung, but no dullness upon percussion. There was tenderness over the right iliac fossa. The mouth was dry, sordes on the teeth, tongue coated with white deposit, pharynx congested, pain upon swallowing, expectoration small in amount and streaked with blood. Temperature on admission 39.4° C. The patient vomited a great deal, and his stools were very liquid and light yellow in color. Crepitant râles, followed by dullness on percussion, developed over the lower lobe of the left lung. Rose spots developed over the chest and abdomen. The temperature continued above 39° C. and at times the patient was delirious. His pulse became very rapid, running up to 150 per minute. Cold affusions were used to control the temperature whenever it rose above 39° C. They were very beneficial in reducing the pulse rate and respiration rate as well as the temperature. The continuance of the disease developed a great deal of exhaustion. The heart remained very weak in spite of stimulation with strychnia and digitalis. About twelve hours before death the patient received a cold bath. The bath improved his general condition very appreciably, although at the time of its administration he was very much exhausted. February 20, at 7 a. m., death occurred.

Necropsy (seven hours after death).—Post-mortem lividity present. Rigor mortis well marked. General nourishment good. Upon removing the calvarium the brain and its membranes were found to be normal. Weight of brain, 1,340 grams. Upon opening the abdomen the organs were found to be in their normal position. The mesentery was dark red in color, but not adherent anywhere. The right lung was found to be adherent; the left lung was free. Upon opening the pericardial sac but a small amount of fluid was found. The heart was removed and sectioned. The right ventricle was dilated, the muscular wall measuring about 1 cm. in thickness. The left ventricle was contracted and its wall measured 2.3 cm. in thickness. The valves were found to be normal and competent. The heart weighed after opening 300 grams. The right lung weighed 575 grams. An area of congestion was present in the lower lobe posteriorly. The left lung weighed 640 grams. The entire

lower lobe was consolidated and dark red in color. From the bronchial tube a purulent material could be squeezed out. The spleen was enlarged; upon its superior portion a necrotic area was found the extent of which was about 4 c. c. Just in front of this was another necrotic area. Both of these areas were sharply defined and extended to the capsule of the spleen. Peyer's patches were found to be very much infiltrated. Numerous ulcerated patches were found which had begun to heal. Spleen weighed 475 grams. Left kidney weighed 220 grams; cortex not well marked. Right kidney weighed 220 grams; in the same condition as the left. The liver weighed 2,140 grams; upon the surface of the right lobe there were several yellowish areas. The gall bladder had a pouch extending from its lower surface about 3 cm. in depth, apparently a dilatation of the gall bladder.

F. I.

CASE III.

M. W., aged 49; nativity, Finland; admitted to marine ward, St. Vincent's Hospital, Norfolk, Va., August 29, 1898; died August 31.

History.—Complaining of a chill, was put to bed and hot-water bags applied. Was very nervous, and said he had been sick for several days. Gave history of being a drinking man. Hyoscine hydrobromate gr. $\frac{1}{10}$ was administered, which quieted him slightly. At 1 p. m. temperature had risen to 41.1 per rectum. Pulse 128, soft and weak; respiration 48. Tongue heavily coated, pointed, tip and edges red. Bronchitic râles over both lungs. Heart sounds weak; mitral and aortic direct murmur. Gave calomel and soda, each 3 gr., guaiacol, whisky, and strychnine; plunge baths. Temperature fell to 98 next morning at 9, but rose to 105.4 at 1 p. m.; fell to 99 next morning at 9 on 31st, and rose to 103 at 5 p. m. Although every effort was made to relieve him he grew worse, and died at 7.50 p. m. August 31.

Necropsy (eighteen hours after death).—Rigor mortis fairly well advanced. Body pretty well nourished. Brain: "Wet;" vessels very much engorged; ventricles contained a good deal of fluid; dura mater adherent. Thorax: Pleura both adherent. Lungs very full of blood; lower lobes of both showed commencing hepatization. Pericardium normal; heart muscle dark and flabby; endocarditis; valves normal. Abdominal cavity: Liver about normal in size, congested, very firm, and resistant. Spleen considerably enlarged, congested, and softened. Right kidney enlarged and fatty; contained oil globules. Left kidney normal in size and fatty. Capsule strips easily from both. Stomach normal. Large intestines inflamed from cæcum to about 8 inches from rectum; several ulcerations near cæcum. Appendix inflamed and contained a foreign body. Small intestines normal.

E. E. F.

CASE IV.

L. A., aged 41; nativity, Norway; admitted to St. Francis Xavier Infirmary, United States Marine-Hospital Service (contract hospital), Charleston, S. C., October 30, 1898; died November 5, 1898.

History.—Taken sick about eight days previous to admission to hospital with cough and fever; no expectoration. On admission had no pain in abdomen, no diarrhea and no spots; no headache; tongue dry and slightly coated. Diagnosis of malarial fever was made, and treatment for same given. On the 5th about 3 a. m. had sudden severe pain in abdomen succeeded by retching and vomiting of glairy fluid. Pain continued, but was relieved by hypodermics of morphia, strychnia, nitroglycerin, etc.: heart's action became very feeble and rapid, and patient died about 9 p. m. on the same day in state of collapse from which it was impossible to cause reaction.

Necropsy (fourteen hours after death).—Rigor mortis present, pupils dilated; body well nourished, abdomen distended, and tympanitic; posterior portion of body

discolored from post-mortem stasis. Heart apparently normal; weight, 320 grams; no fluid in pericardium. Right lung showed posterior congestion in lower lobe; weight, 630 grams; firm adhesions in right pleura; left lung also congested in posterior portion, but to a lesser degree; weight, 600 grams; no fluid in either pleural cavity. Liver enlarged; otherwise normal; weight, 2,040 grams. Spleen enlarged; weight, 360 grams; extremely friable and disorganized. Right kidney normal; weight, 180 grams; left kidney normal; weight, 180 grams. Small intestine distended with gas, and contained numerous ulcers in lower portion of ileum: at the bottom of one ulcer were two perforations. Abdominal cavity contained about 300 c. c. dirty colored fluid; peritoneum somewhat injected; mesenteric glands enlarged. Other organs and structures not examined.

F. F. S.

J. V.

YELLOW FEVER.

CASE 1.

A. F., aged 29; nativity, Germany; color, white; was admitted to the marine hospital, New Orleans, La., October 13, 1898. Died October 15, 1898.

Patient had been in New Orleans, La., for three weeks previous to admission to hospital. He came from Cuba. Was taken ill the Saturday before admission October 8. Weakness in the knees, headache and fever. Took six pills for his bowels. Bowels have moved freely since. Vomits when he moves about. Temperature at 3 p. m. October 13, 38 $\frac{3}{4}$. Pulse, 84. Respiration, 22. Eyes and skin yellow; is very nervous and weak. 4 p. m. vomited black fluid, about 250 c. c.; 4.30 vomited black fluid, about 200 c. c.; 8 p. m. tincture of iron mixture, a teaspoonful (15 minims, tinct. muriate of iron to the teaspoonful), rubbed back, side, and stomach with croton oil: 9 p. m. vomited black fluid, 150 c. c.; 10 p. m. ether and spirits ammonia mixture; 12 p. m. tincture of iron mixture.

October 14.—1.30 a. m. vomited black fluid, 250 c. c.; 2 a. m. ether mixture; 4 a. m. iron mixture, vomited black fluid, 150 c. c.; 6 a. m. ether mixture, catheterized 6 ounces urine (not kept for examination); 7.30 a. m. vomited black fluid, a mouthful; 8 a. m. iron mixture, delirious, hiccoughs; twitching at mouth and fingers; 10 a. m. ether, vomiting. Has a continual oozing of red blood from rectum from the time of admittance October 13, 3 p. m.; 12 m., iron mixture: vomiting continues; 2 p. m. ether, vomiting; 4 p. m. iron mixture, 1 $\frac{1}{2}$ drams; 5 p. m. egg water, vomiting; 6 p. m. chalk and tincture Kinomixture and ether, catheterized 3 ounces; 8 p. m. iron mixture, vomiting; 10 p. m. ether and chalk mixture vomiting; 12 p. m. can not swallow, delirious, convulsions and coma; 3.10 a. m. October 15, died.

Necropsy (eight hours after death) by Surgeon Wasdin.—Rigor mortis marked. Skin of a rich yellow color, eyes yellow, pupils widely dilated. Hypostasis of ears, neck, trunk, buttocks, and genitals: thigh, legs, and feet mottled appearance. Mouth and lips stained with bloody ooze. Peritoneum fatty, mesentery somewhat engorged. Intestines moist. Liver was normal in size, light-yellow color, slightly boxwood, firm and full of blood, capsule normal. Spleen was normal. The left kidney was congested, fatty at base of pyramid, cortical structure swollen or tumefied; markings obscure. Right kidney similar in appearance and size. Heart: The vaso-vasorum of vessels at base of the heart were dilated and well marked. Pericardium has similar infiltration or congestion. Extravasation of vessels of pericardium at base of heart, considerable in parts. Stomach contained black vomit. Mucous membrane intensely infiltrated and congested, showing points of petechiæ filled with dark-colored blood, especially in great cul-de-sac. Duodenum was dark in color: shows similar condition as stomach; not so well marked.

C. S. P.

ERYSIPELAS.

CASE 1.

Phlebitis.

E. J. C., aged 39 years; nativity, Maine; was admitted to the United States Marine Hospital, Stapleton, Staten Island, February 21, 1899, and died March 7, 1899. Patient upon admission had an enlargement of the right inguinal lymph glands about the size of a hen's egg, not adherent to skin or underlying structure; no pain or tenderness; there was no history or evidence of gonorrhea or ulcer of penis, but patient admitted of promiscuous intercourse some few weeks previously. Glands has been enlarged for about two weeks; patient was given mixed treatment, and pressure applied by means of a shot bag. February 27, the glands remaining in about the same condition, it was decided to excise them. Under ether anæsthesia, the glands were dissected out. There was a small amount of pus in the glands, which ruptured during the operation. The wound was drained with a strand of iodoform gauze. Next day patient had not slept and complained of pain in lower abdomen, dressed, but there was only slight redness about wound; next day it was somewhat more marked. There was a fever up to 40° C., and it was decided to isolate patient, and he was removed March 2 to isolation ward. Erysipelatous area was dressed with ichthyol ointment 20 per cent.

March 3.—There was some bleeding from wound and saphenous vein was found tender and hard to below the knee, and marked by red line. Erysipelas slowly spreading; temperature 39° C. The phlebitis and erysipelas both continued to spread, the phlebitis involving all the superficial veins of the anterior surface of the leg to the toes. Moderate cedema was present. Pulse became more weak. Temperature varied from 39–40° C., and patient died from exhaustion on March 7. Treatment: Whisky and strychnine with wet boric compresses to leg.

Necropsy (fourteen hours after death).—The body was that of well-developed male about 5 feet 8 inches tall, fairly well nourished, post-mortem lividity very marked, rigor mortis present, pupils moderately dilated, cornea glazed. There is an area extending from bubo wound upward and outward to the level of the umbilicus and posteriorly to the great trochanter, which is red and slightly swollen. Superficial veins of right leg are marked by dark red lines, becoming brighter red on the foot.

The course of the veins is marked by a hard cord-like swelling. There was an incision about 3 inches long in right groin parallel to Poupart's ligament, leading into a considerable cavity. The calvarium, brain case, and membranes of the brain were negative, and the venous sinuses were much engorged with blood. Brain weighed 1,350 grams, and was negative on section, except that vessels were rather more prominent than usual. The anterior mediastinum was negative, and the thymus gland not found. The heart weighed 320 grams and appeared large; the right side was distended with dark fluid blood, with a small amount of ante-mortem clot in the veins, the left side very firmly contracted and almost empty, except for slight ante-mortem clots. The valves were competent and apparently normal. The endocardium was negative. The pericardium was smooth and shining and contained a few cubic centimeters of a pale straw-colored fluid. The left lung weighed 440 grams, floats and crepitates throughout. The upper lobe was grayish, with black mottling. The lower lobe was dark red and much more solid. Section was negative. A small amount of frothy mucus was present in bronchi. Right lung weighed 480 grams and was like the left one. The pleuræ were smooth and shining. There was no fluid and no adhesion. The aorta was atheromatous throughout from semilunar valves to branching in lower abdomen. There were a few calcareous patches where great vessels to the neck are given off. The omentum was negative. The peritoneum was smooth and shining, and con-

tained no fluid. The spleen weighed 290 grams, and was very friable, dark, and congested on section. The left kidney weighed 190 grams; the capsule peeled readily, leaving the surface smooth and shining; the stellate veins were well marked. Section is pale and yellowish, the markings are distinct, and the cortex very narrow. The right kidney weighed 170 grams. The capsule peels readily, and the section is the same as in left one. The suprarenal capsules together weigh 10 grams, and were negative in appearance. The urinary bladder was contracted and empty, except for a few cubic centimeters of a purulent fluid. The prostate gland and seminal vesicles were negative. The testicles were rather small, but apparently normal on section. The stomach was distended with gas and contained a small quantity of a yellowish fluid. The duodenum, small and large intestines were all nearly empty and negative in appearance. The liver weighed 1,960 grams; surface smooth and shining, cuts readily, color grayish brown; the lobules have dark centers and light periphery. The gall bladder was nearly empty, and duct was patent. The pancreas weighed 90 grams, appeared normal. All the veins of body were engorged with a dark fluid blood. The erysipelatous area had congested vessels. The wound on examination showed that the internal saphenous vein had been ligatured close to the femoral, and again in lower angle of wound. There were no signs of inflammation in femoral vein. Section of saphenous had clotted blood and the walls were dark and blood stained.

A. R. T.

CASE II.—*Pachymeningitis—Leptomeningitis.*

G. McK.: Aged 24 years; nativity, North Carolina; admitted to the United States Marine Hospital December 28, 1898; died January 5, 1899.

History.—On admission the tissues about his left eye were swollen so that he could not separate the lids. The swelling was red and angry looking. He complained of severe headache. Temperature, 38° C. Case was diagnosed as erysipelas; was treated by local application of iodine and by quinine phenacetin and tr. ferri chlor. internally; bowels were kept open. On the 30th of December the swelling left the left eye, and next day it appeared over all of forehead and right eye. The same treatment was continued with the addition of stimulants, and ice was applied to the head. Temperature ranged from 38° C. to 40.2° C. Headache increased, neck became rigid, and he became delirious. Fluctuation was made out at base of nose. An incision was made allowing the escape of some pus. Death occurred at noon on January 5, 1899.

Necropsy (twenty-one and a half hours after death.)—Rigor mortis well marked. Patient well developed and nourished. On stripping anterior flap of scalp forward the frontal bone was found to be denuded of periosteum for a considerable area. On removal of calvarium pus was found over left anterior half of dura mater, and the anterior half of the superior longitudinal sinus was filled with a thrombus. On removing the dura a thick layer of creamy pus was found covering the cortex of the brain on its left anterior half. The vessels of the pia were deeply engorged. The structure of the brain was in normal condition and weighed 1,400 grams. Heart was normal; weight, 290 grams. About 50 c. c. of dark fluid in pericardial sac. Right lung had few adhesions at apex; weight, 780 grams. Left lung had few adhesions at apex; weight, 700 grams. Both lungs were congested; liver normal; weight, 2,090 grams; spleen enlarged and congested; weight, 475 grams; right kidney normal; weight, 220 grams; left kidney normal; weight, 215 grams; pancreas normal; alimentary tract normal; genito-urinary organs normal. Judging from condition of tissues, internal and external of skull, the infection spread through the openings of the cribriform plate of the ethmoid bone.

J. H. O.

PYÆMIA.

CASE 1.

Wound of lower extremity—Pneumonia.

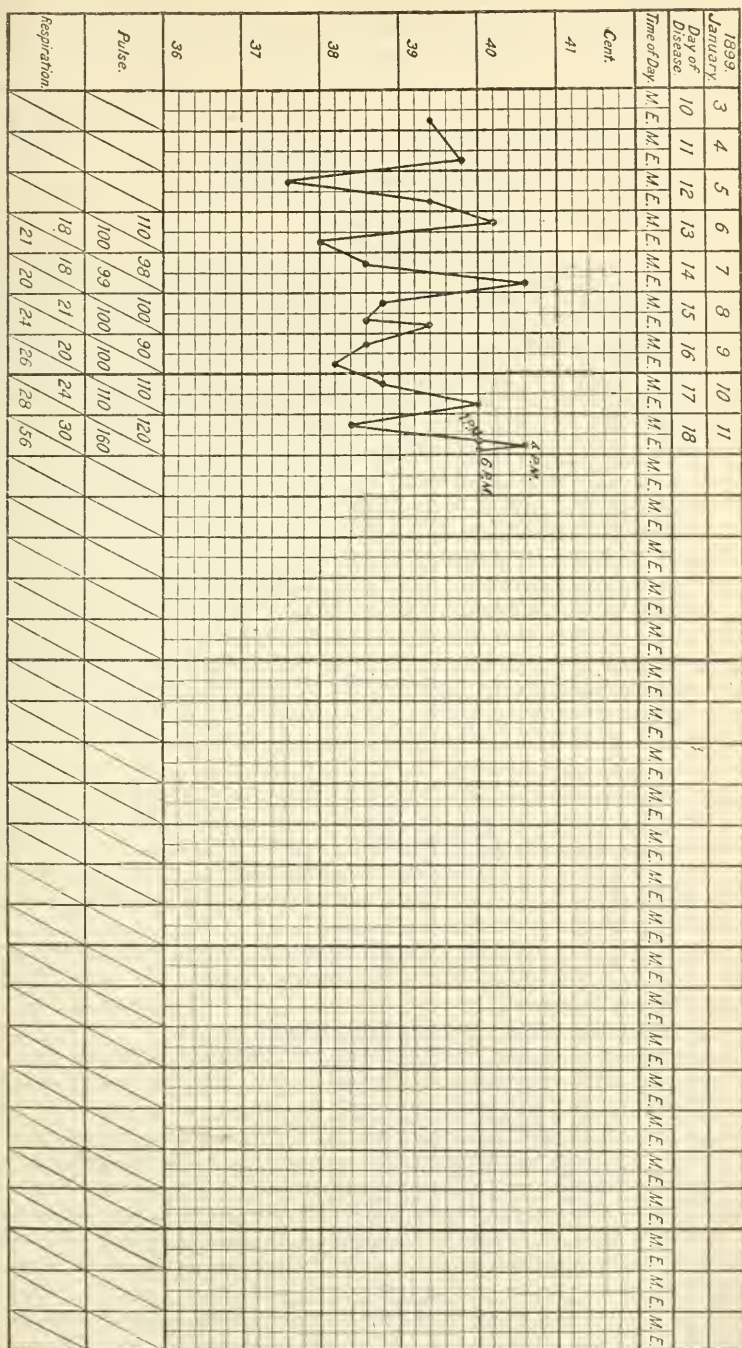
G. O.: aged 22 years; nativity, Sweden: was admitted to the United States Marine Hospital, port of San Francisco, Cal., January 3, and died January 12, 1899, at 3.30 a. m.

History.—Patient had never been ill before. He said he injured his leg on the night of December 24, 1898, while jumping ashore from a boat, by striking it against a projecting piece of wood, causing a punctured wound on the inner surface of the middle third of the thigh 4 cm. in diameter and about 15 cm. deep. It extended upward beneath the skin and fasciæ for a short distance and then entered the muscular tissue and apparently ended just below Poupart's ligament. Careful exploration, under strict asepsis, failed of detecting any foreign body in the wound, which was irrigated with bichloride 1:2000 solution and dressed. January 5 a moderate amount of rather foul-smelling pus was noted to be discharging from the wound. This increased until January 8. On that date chloroform was administered, the wound enlarged, and a piece of wood 5 cm. long and 2.5 cm. in diameter extracted. Irrigations of bichloride were resumed and dressings reapplied. January 11 patient complained of pain in chest and abdomen, and his temperature began to rise. Ether was administered and thorough exploration of the wound made. A few small blood clots and a small amount of pus were found. The opening was further enlarged and a large drainage tube inserted. Stimulation in shape of port wine was ordered. The temperature was taken four times in the twenty-four hours and the wound irrigated same number of times. January 4 to 5 quinine sulphate, 1 gram at 8 p. m. and 0.64 gram at 6 a. m., were administered. January 6 quinine sulphate, 1 gram, was given at 11 a. m. and 4 p. m. On 7th 1 gram quinine, at 7 a. m., until January 11. Then carbolic acid and quinine in capsules were administered five times in twenty-four hours, and port wine given freely four times during the day. An oil silk jacket was put on. The elevation of temperature at 5 p. m. on this date appeared to be due to pneumonia, which had become marked in a few hours. At 8.30 p. m., January 11, delirium, slight in character, was noted, and extreme restlessness made it necessary to maintain a constant watch over the patient.

Gradual depression set in, and the patient could not be made to rally by stimulation. Hypodermic injections of brandy and strychnine were given at 3 a. m. January 12, but patient died at 3.30 a. m.

Necropsy (eight hours after death).—The body is that of a well-developed, well-nourished, white adult male of medium size. There are no distinguishing marks on body. Rigor mortis present. Peritoneum is normal in appearance. Intestines are distended with gas, but are otherwise normal. The exterior of the pericardium is normal, but its inner surface is slightly injected. It contains 60 c. c. of clear straw-yellow fluid. The heart is slightly fatty. The right auricle is filled with clotted blood and a gray fibrinous clot. The left auricle is filled with a thick dark blood clot. Both ventricles are empty. The right lung weighs 595 grams. The superior lobe presents an acute oedema, with slight engorgement. The middle and inferior lobes are in a state of deep engorgement nearing the stage of red hepatization. The inferior lobe contains one small acute abscess filled with yellow pus. The left lung weighs 497 grams. Its inferior lobe was covered with a recent deposit of fibrin in a thick layer. The inferior lobe is in the stage of red hepatization and contains a small abscess. The superior lobe is congested. The spleen weighs 342 grams. An abscess 1 c. m. in diameter is found immediately under the capsule, at a point directly opposite the hilus. The

splenic tissue is very soft and easily broken. The left kidney weighs 175 grams.



Opposite the hilus are three small abscesses. Capsule strips easily, except near

the abscesses, where it leaves a torn and granular surface. The kidney is congested. The right kidney weighs 155 grams. The capsule strips easily, but pus can be squeezed from the uriniferous tubules. The liver weighs 2,140 grams, is pale in color, but otherwise normal. The brain weighs 1,270 grams and is normal.

H. A. S.

T. B. P.

J. M. G.

TUBERCLE OF LUNGS.

CASE 1.

W. J., aged 37 years; nativity, Finland; was admitted to the United States Marine Hospital, port of San Francisco, Cal., June 2, 1897, and died June 7, 1899.

History.—The patient was in this hospital from October 26, 1896, until May 4, 1897, and during this time was treated for acute catarrhal bronchitis. He returned to the hospital June 2, 1897, because of a severe cough, progressive weakness, loss of weight, shortness of breath, and aphonia. The patient also complained of severe pain in the right side of chest. He expectorated very little, and the examination of the sputum was negative. He also complained of pain in the hips, back, and arms; at times the pain would be very severe and then would be entirely absent for several days. On August 11, 1897, microscopical examination showed tubercle bacilli present in the sputum (before this repeated examinations had proved negative), thus confirming the diagnosis of tubercle of lung. The patient coughed almost incessantly, the sputum was tenacious, and he had great difficulty in expectorating. He complained of sore throat (inflammation of the larynx and pharynx) and also an elongated uvula. On October 10, 1897, examination showed the movements of the chest to be more marked on the left side, vocal fremitus markedly increased on the right side, a dullness of the right apex, extending as low as the third interspace in front and the fourth interspace in the back. The cough was then very severe and expectoration unusually difficult.

January 5, 1898.—The cough has been gradually more spasmodic in character. The patient has been expectorating blood occasionally during the past twenty-four hours. He complained of feeling weak and tired.

January 19, 1898.—The right sciatic nerve was sensitive to pressure and pained him when he walked or attempted to bend the leg. This pain lasted only a few days at a time.

January 29, 1898.—The patient has been having night sweats for several nights.

March 27, 1898.—The patient complained of pains in his chest. Adhesive strapping seemed to give relief.

April 1, 1898.—The patient had another attack of sciatica.

August 26, 1898.—Tubercle bacilli were again found in the sputum.

September 20, 1898.—The patient complained of a discharge from the right ear and of pain in the neck and head.

February 9, 1899.—Examination showed the left lung to be more inflated than the right. Resonance was abnormally increased over the left thorax. Loud blowing sounds were heard on both inspiration and expiration over the left side of the thorax. Mucous râles heard over entire left lung. A blowing sound was heard over the apex of the right lung during expiration. Just above the right nipple many bubbling râles were heard and also a blowing sound, as if through a small orifice.

April 27, 1899.—The patient complained of sore throat, and hoarseness more marked than before. Examination of larynx showed raised grayish patches on the right vocal cord with congestion over the false cords.

April 30, 1899.—There was pain in the throat and great difficulty in swallowing.

June 2, 1899.—The patient complained of not being able to expel the mucus in his throat and that his food came up after eating. He seemed much weaker. The pulse at wrist was not strong.

June 7, 1899.—The patient was very weak. The pulse at wrist barely discernible. Death occurred at 2 p. m. June 7, 1899.

Treatment: The patient was given expectorant mixtures, creosote, cod-liver oil, malt and whisky, and strychnine. Cathartics were given from time to time as indicated. Electricity was applied to the throat, and sedative sprays were also used. The ear was syringed frequently with a solution of permanganate of potassium. Chloroform liniment was rubbed on the affected limbs, and he was given salicylate of sodium internally. Abundance of easily digestible nourishment, as eggs, milk, beef teas, and essences, were urged upon him.

Necropsy (twenty-four hours after death).—Body that of a fairly developed, greatly emaciated, adult white male. Rigor mortis present. The right lung is adherent to the anterior thoracic wall. The left lung is free from adhesions, except in the region of the apex. The surface of the heart is pale and covered with a thin layer of fat. The right cavities of the heart are filled with clots, partly red and partly white. The left cavities are empty. Heart weighs 247 grams. All the valves are apparently normal. The ascending and beginning of transverse portions of the aorta are dilated, and on the walls are several small, elevated, white patches, some of which are calcareous. The epiglottis is very much thickened. The right arytenoid cartilage is ulcerated, and both true vocal cords are covered with large ulcers. The left lung weighs 597 grams; in the apex is a cavity the size of a walnut lined with a muco-purulent material, and having trabeculae of connective tissue along its walls. The upper lobe is dark grayish in color, and has pigmented areas here and there. It has a rough nodular feeling to the touch. The lower lobe is congested, especially the lower part; the anterior border is emphysematous. The bronchi are thickened, and when cut a purulent material exudes from them. Right lung, weight, 525 grams; in the upper lobe is a cavity with very thin walls, containing about 250 c. c. of muco-purulent material, on the edges of this cavity are bands of connective tissue. In the lower lobe are several smaller cavities, varying in size from that of a pea to that of a walnut. They contain muco-purulent material, and are continuous with the large cavity in the apex. The bronchi are somewhat thickened, and contain muco-purulent material. The mesenteric glands are enlarged. In the ileum, about 10 c. m. from the ileo-cæcal valve, is a small ragged ulcer with a grayish base; the ileo-cæcal valve is the seat of extensive ulceration of a similar character. In the cæcum there is one large and one small ulcer. The walls of the intestines are thickened. Liver, weight 1,225 grams, is adherent to abdominal wall by clear adhesions. It is of a pale yellowish color. The capsule is considerably thickened. The gall bladder is distended with bile. The left kidney weighs 145 grams; capsule not adherent. Both cortex and pyramids of a pale yellow color. Minute blood vessels may be seen coursing through the cortex. Right kidney, weight 100 grams, resembles the left in every particular, except that in one of the pyramids is found a small white calcareous mass the size of a pin head. The spleen weighs 225 grams, enlarged, irregular shape, adherent to anterior abdominal wall by fibrous adhesions. Capsule and blood vessels are thickened. The substance is firmer than normal. Posteriorly the scalp is the seat of hypostatic congestion. The skull is thickened, the pachionian depressions are well marked. On opening the cranial cavity a considerable amount of serous fluid escaped. The dura mater is thickened. The arachnoid is thickened and opaque. The pia mater shows no evidences of changes having taken place. The brain weighs 1,267 grams, and apparently normal.

J. B. G.
W. J. L.
J. M. G.

Microscopical examination.—Lung: Shows characteristic tubercular lesions. Kidney: Section includes nodule mentioned above which is composed of fibrous tissue inclosing a few atrophied tubules. Otherwise the kidney shows no marked abnormality.

D. M.

CASE 2.

O. D.; age, 32 years; nativity, Canada; admitted to the United States Marine Hospital, port of San Francisco, Cal., May 23; died June 28, 1899.

History.—Family history negative as to tuberculosis. About May 1 the patient said he caught a cold from sleeping in an exposed place. The prominent initial symptoms were evening chill, followed by fever and vomiting after eating. On admission he complained of pain in left side of thorax, especially noticeable on deep inspiration, and also of a cough rendered worse by exertion. Examination showed diminished expansion on left side of chest; bubbling mucous rales, diminished vocal fremitus, and marked dullness on percussion over same area. Right lung universal, exaggerated breathing, and a few mucous rales at base. Heart sounds normal. Tubercle bacilli present in sputum. In the course of the month of June patient had temperature of hectic type and rapidly declined in flesh and strength. During the latter half of month he had a number of attacks of hemoptysis of considerable severity. On the 27th he rather suddenly fell into a state of profound collapse and died following morning. Treatment: Patient was given creosote, atropine sulphate, liquor potassii, arsenitis, turpentine, ergot, morphine sulphate, elixir iron, quinine and strychnine, whisky and strychnine, with full and nourishing diet.

Necropsy (four hours after death).—Body that of a fairly developed, rather emaciated, adult white male. Rigor mortis slight. The liver extends about two fingers breadth below the costal margin in the right mammary line. The stomach is distended and the greater curvature extends as low as the umbilicus. There is no fluid in the pleural cavities. The left lung is retracted and is adherent at the apex, all along the posterior surface, and at the base by dense fibrous bands. The right lung is free except at the apex, where it is adherent by firm bands. The pericardial sac is distended and contained a considerable quantity of clear straw-colored fluid. Heart, weight 460 grams. Right auricle distended and contains a large ante-mortem clot. The left auricle contains a small mixed (dark-red and ante-mortem) clot. Both ventricles are empty. The left auriculo-ventricular orifice admits three fingers. The right auriculo-ventricular orifice admits four fingers. All the valves are normal. The intima of the ascending aorta is perfectly smooth and normal. Left lung: Weight, 507 grams; greatly compressed; somewhat torn in removal on account of very dense adhesions. The lung does not crepitate in any part, nor will any excised portions float. There is a great overgrowth of fibrous tissue. The lung is carnified and studded with tubercles. At the apex are several cavities, the largest of which is the size of a walnut. Right lung: Weight, 805 grams; pale in color; feels emphysematous on pressure; the air vesicles along the anterior border are dilated. On section the inferior lobe posteriorly is the seat of hypostatic congestion. The lung crepitates throughout except at the apex, where are observed several small cavities, the largest of which is the size of a small walnut. Left kidney: Weight, 232 grams; considerably larger than normal; pale in color; capsule slightly adherent. On section, a cyst the size of a buckshot is found in the upper portion, in the outer zone of the medulla. The kidney substance is pale and contains but little blood. The medullary portion is darker than the cortex, which is thickened. There is a moderate deposit of fat in the pelvis. The amyloid reaction was not obtained with iodine. Right kidney: Weight, 190 grams; much smaller and less pale and anæmic than the left. Liver: Weight 2,315 grams; gall bladder distended with bile; capsule smooth, surface dark in color. On section, the liver substance is dark in color, contains considera-

ble blood, and is of firm consistence. Interlobular connective tissue increased. Spleen: Weight, 335 grams; of firm consistence, pale in color. There is an apparent overgrowth of connective tissue. No amyloid reaction obtained with iodine. Brain: Weight, 1,435 grams; apparently normal.

D. M.
W. J. L.
J. M. G.

CASE 3.

F. H.; age, 47 years; white; nativity, California; admitted to the United States Marine Hospital, Chelsea, Mass., March 6, and died April 7, 1899.

History.—The patient complained of weakness, loss of appetite, hacking cough, and profuse expectoration, which was at times streaked with blood. Temperature on admission, 38.4°; pulse, rapid and soft; dullness over the apices of both lungs; tubular breathing and prolonged expiration over the same area. The tubercle bacillus was found in the sputum. Nine days before death diarrhea set in and continued to the end.

Necropsy (two hours and forty minutes after death).—Rigor mortis absent. Post mortem lividity present. Body very much emaciated. Skin over the sacrum gangrenous. A portion of the glans penis was also gangrenous. Heart, small and fatty. Weight, 300 grams. About 25 c. c. fluid in the pericardium. The valves were normal. The thoracic aorta had several fatty patches present in the intima, and there was a small ulceration about 0.5 cm. in diameter containing a calcareous plate. The left lung weighed 1,000 grams. Posteriorly and at the apex the lung was adherent firmly. There were several cavities, small in size, throughout the lung.

The right lung weighed 1,600 grams. Almost the entire lung was consolidated. The apex contained a cavity about 4 cm. in diameter. There were numerous smaller cavities through the rest of the lung. The pleura was adherent. The larynx and trachea were normal. The abdominal contents were normal in position. The peritoneal cavity contained about 50 c. c. of a straw-colored fluid. Stomach appeared to be normal. The last 4 feet of the small intestine was very much injected in places. The colon also presented evidence of having been inflamed. The liver weighed 1,600 grams. The capsule of the anterior surface of the right lobe was thickened. The gall bladder contained about 25 c. c. of bile. The ducts were pervious. The pancreas weighed 60 grams. It was normal. The left kidney weighed 160 grams; normal. The right kidney weighed 160 grams; normal. The bladder was small and contracted; the mucous membrane thickened. The suprarenal capsules weighed 10 grams each. They appeared to be normal. The brain weighed 1,350 grams. It and its membranes appeared to be normal. The spinal cord was not examined.

Death was caused by the extensive destruction of lung tissue by the tubercle bacillus.

F. I.

CASE 4.

N. M.; age, 32 years; nativity, Indiana; admitted to the United States Marine Hospital, Cleveland, Ohio, September 27, 1898; died February 13, 1899.

History.—Patient was admitted to this hospital complaining of cough, night sweats, and rapid loss of weight. He stated on entering that his mother and one sister had died of tubercle of the lung; family history otherwise negative. He had been troubled with nasal catarrh for years, and about three years ago he had a soft chancre. Two years ago he contracted a severe cold, and has had a persistent cough ever since. One year ago he began to have night sweats. His former weight was 148 pounds; his present weight is 126 pounds; appetite very poor. Physical examination gave the signs of cavity formation at apices of both

lungs, and a profuse bronchitis. Heart, rapid; no murmurs detected. During the latter part of December the patient developed a severe diarrhea, which failed to yield to treatment. Several weeks before death he developed an ulceration of the larynx and was not able to speak above a whisper. The patient continually grew worse from the time he was admitted to the hospital, and died February 13, at 3 p. m.

Necropsy (seventeen hours after death).—Lividity and rigor mortis not present. General nourishment very poor. Pericardial sac normal. Heart weighed 255 grams; nourishment fair; ante-mortem clots in both auricles and ventricles; valves all competent. There was an extensive ulceration of the vocal chords. The left pleural cavity was a mass of old adhesions. The left lung weighed 860 grams; the upper and lower lobes were the seats of cavity formation, and the lung substance was studded throughout with tubercular deposits and much congested in certain areas. The right pleural cavity was also the seat of numerous old adhesions. The right lung weighed 985 grams; the upper lobe contained a large cavity and the remaining lung substance was thickly studded with tubercles; the lower lobe was oedematous and congested. The peritonemum was apparently normal. The stomach was bile-stained and covered by a thick, tenacious mucus. The small and large intestine contained numerous ulcerated areas, the long axis of the ulcer being transverse to the long axis of the bowel. The liver weighed 1,710 grams, and offered increased resistance on section. The gall bladder contained 40 c. c. of fluid, which appeared to be a mixture of mucus and bile. The pancreas weighed 125 grams. The right kidney weighed 140 grams; the left kidney weighed 120 grams; in both kidneys the capsule was adherent and the cortex slightly thinner than normal. The pelvis and ureters were normal. The bladder, urethra, and prostate presented no pathological changes. The spleen weighed 285 grams. The brain weighed 1,350 grams. There were several small tubercular deposits on the dura mater along the superior longitudinal sinus; the membranes were otherwise negative.

H. W. W.

CASE 5.

E. E. J. (colored); aged 37; nativity, Kentucky; admitted into the United States Marine Hospital, Cincinnati, Ohio, June 17, 1898, and died September 1, 1898.

History.—Patient gave a family history of tuberculosis, a sister, brother, and father having died of phthisis. Present illness began three months before admission, when he "caught cold." Has had shortness of breath. Has had night sweats; cough worse in the evening. Has been spitting up blood profusely. Physical examination: Patient very ænemic and emaciated; considerable depression in supra and infra clavicular region, more marked on the right than left side, diminished expansion on right side. Respirations considerably increased. Dullness over right lung at apex; also over left lung above and below clavicle. Bronchial breathing marked; no râles present; temperature, 39°. Patient did not improve; cough troublesome since admission. Has had several severe hemorrhages. Patient gradually grew weaker and died September 1, 1898, at 7 o'clock p. m.

Necropsy (fifteen hours after death).—Rigor mortis marked. Emaciation considerable. Brain normal, except increase of fluid in arachnoid spaces, and the membranes were slightly thickened; weight, 1,276 grams. Thorax: Plura adherent to left side. Left lung was one mass of cavities; weight, 828 grams. Right lung: There were several small cavities. The lower lobe showed tubercular deposits; weight, 940 grams. Heart: Weight, 360 grams; valves normal. Pericardium normal; no excess of fluid. Abdomen: Stomach normal. Liver apparently normal; weight, 1,880 grams. Mesenteric glands were enlarged and caseous. Spleen rather soft; weight, 97 grams. Right kidney normal; weight,

160 grams. Left kidney normal; weight, 182 grams. Intestines: There was congestion throughout ileum.

J. W. S.
W. A. W.

CASE 6.

A. J.; aged 26, weight, 130 pounds; height, 5 feet 6 inches; negro waiter; admitted to United States Marine Hospital, Chicago, Ill., June 28, 1898. Died November 2, 1898.

History.—Family history was negative. Six months before admission had pneumonia and since then has been losing weight. Complains of a bad cough, night sweats, and pain in chest. On physical examination the right lung was dull on percussion from the apex to the fourth rib. Increased vocal fremitus, bubbling râles on auscultation; with the exception of numerous bronchial râles the left lung gave no physical signs. On examination of the sputa many tubercle bacilli were found. Patient improved considerably during the first five weeks in the hospital; then began to fail. During the last two weeks of his illness his loss of flesh and strength was marked. Stimulating and supporting treatment was given and the symptoms treated as they arose. Morphia was exhibited toward the last for his pain.

Necropsy (sixteen hours after death).—Body of a negro, greatly emaciated. Post-mortem congestion, slight. Rigor mortis not marked. Left foot œdematous. The skull cap, brain case, and sinuses were normal. Brain was normal and weighed 1,400 grams. The membranes were normal. The anterior mediastinum was normal. Heart weighed 290 grams. The cavities were full of dark, clotted blood. The valves were competent but ventricles appeared slightly dilated. Pericardium contained about 100 c. c. of clear fluid. The right lung was bound down by pleural adhesions. A large cavity extended from the apex as far down as the fifth rib. Tubercular deposits were found in every lobe, varying in size. The left was bound to the thoracic wall by adhesions posteriorly and was tubercular throughout. There was no cavity. The pleural cavity was greatly reduced in size by the adhesions and contained about 300 c. c. of straw-colored, clear fluid. On account of the adhesions it was impossible to remove lungs to weigh them. The omentum was very small and appeared to be normal.

The spleen weighed 95 grams; capsule was nonadherent. It was normal, and showed no signs of tubercle. The left kidney weighed 180 grams; capsule was nonadherent and appeared normal. The right weighed 140 grams; capsule nonadherent, and was soft and friable. The supra renals were apparently normal. The urinary bladder contained about 150 c. c. urine, and was normal. The organs of generation were normal. The rectum, duodenum, small and large intestines, were normal. The small intestines were full of fecal matter, the large comparatively empty, containing only gas. The stomach was small in size, about 300 c. c. capacity. Its mucous membrane was normal. The pancreas was apparently normal. The solar plexus was apparently normal. The liver weighed 1,540 grams; was dark and congested on its edges; capsule was nonadherent. It was slightly smaller than usual, showed no signs of tubercle externally or on section. The gall bladder was normal, contained about 20 c. c. bile. The great vessels and nerve trunks were normal.

H. C. R.
H. W. S.

CASE 7.

J. O.; aged 47 years; nativity, Sweden; admitted to United States Marine Hospital, Boston, Mass., April 10; died May 7, 1899.

Family history good. Previous history: Says he does not remember any disease that he had when a child. Had gonorrhea once, eight years ago, and at the same

time had two chancreoids, also a suppurating bubo on right side. Gave no history of alopecia or eruption on body. Present sickness: About five months ago, while in Brazil, had a chilly sensation two or three times a week, with slight fever and sweat. Has lost weight continuously, and suffers with shortness of breath. Has sharp darting pains through chest and especially on left side. On admission, appetite poor, bowels open. Physical examination: Right cornea was opaque. Pulse 92, and very weak. No murmur heard over heart. Prolonged expiration on both sides, more pronounced over apices posteriorly. On percussion, flatness anteriorly, both sides of chest. On inspection, slight bulging of left side. Urine, analysis negative. Sputum examined and tubercle bacilli found. Temperature on admission was 38.8° C., and the temperature chart shows an evening rise and morning fall, ranging from 37° to 39° C., until death.

Necropsy (eighteen hours and fifty minutes after death).—External appearance: An old scar 1 inch in length in right inguinal region; petechiæ on legs, arms, face, and ears. Post-mortem lividity present. Rigor mortis marked; body emaciated. Heart, weight 300 grams. Aortic, tricuspid, mitral, and pulmonary valves competent. Cavities normal. Walls showed slight fatty degeneration. Pericardial sac normal, and contained 300 c. c. fluid. Aorta normal. Uvula and right true vocal cord ulcerated. Trachea roughened on its inner surface by miliary tubercles. Left lung weighed 1,270 grams; right, 970 grams. Both contained pigment, and were consolidated and studded with miliary tubercles. On section, several small vomiciæ and many calcareous deposits were discovered. They grated against the knife and felt like sand. The pleural cavities were almost obliterated by pleural adhesions. The stomach, intestines, gall bladder, and bile ducts appeared to be normal. Liver, weight 1,770 grams, color, pale. Pancreas, weight 110 grams. Kidneys—left, weight 125 grams, right 135 grams. Bladder and urethra appeared to be normal. Prostate slightly enlarged. Suprarenal bodies—left, weight 10 grams, right 8 grams. Spleen, weight 320 grams. Scalp, skull, brain, and its membranes appeared to be normal. Weight of brain 1,280 grams. Spinal cord not examined. A miliary mass from the lung was examined under the microscope and the tubercle bacilli were found in great abundance.

F. I.

CASE 8.

G. P., age 26; nativity, North Carolina; admitted to United States Marine Hospital, Baltimore, Md., December 13, 1898; died, April 9, 1899.

History.—Mother died of tuberculosis, rest of family healthy. Patient's health good until present sickness began in September, 1898, with a deep cold accompanied by daily chills. On admission patient was much emaciated and quite weak. Had lost flesh rapidly in past two months. Had a constant cough with pain near right nipple; expectoration being free. Very short of breath and pulse over 100. Temperature rising every evening from one-half to 2° C. Over right apex there was amphoric breathing and pectoriloquy, the lower lobes of right lung giving dullness and exaggerated breath sounds. Left lung also gave slight dullness, exaggerated fremitus, and fine râles. Sputum showed large numbers of tubercle bacilli. Improved slightly during first month, extra diet, cod-liver oil and creosote, and whisky being given. Patient then declined rapidly until death.

Necropsy (six hours after death).—Abdomen opened, contents examined and found normal except mesenteric glands, which were numerous and enlarged. Brain: Weight, 1,480 grams. Dura closely adherent to calvarium, and torn in removal, dark fluid blood escaping. Brain substance normal. Thorax: Pericardium contained 30 c. c. of serum. Heart: Weight, 350 grams; walls flabby; cavities contain clots and small amount of fluid blood. Valves competent. Lungs: Left—Weight, 680 grams; color dull red, mottled with gray; pleura

adherent through entire extent; whole lung is consolidated, the air passages containing a muco-purulent fluid, and the lung tissue being filled with small tubercles. Right lung—Weight, 690 grams; pleura is closely adherent about the apex, which contains a pus cavity 4 by 4 cm.; the whole lung is studded with tubercles and numerous small cavities. Liver: Weight, 1,650 grams; normal in appearance; gall bladder contains about 10 c. c. of yellow bile. Pancreas: Weight, 80 grams; normal. Spleen: Weight, 230 grams; normal. Right kidney: Weight, 160 grams; normal. Left kidney: Weight, 150 grams; normal. Intestines: Pale and empty; mesenteric glands enlarged. Bladder and penis not examined.

S. R. T.

G. P.

CASE 9.

G. P.; age, 55; nativity, Finland; admitted to the United States Marine Hospital, Stapleton, Staten Island, port of New York, September 1, 1897; died, January 31, 1899.

History. Family history negative. Present history: Had gonorrhœa and rheumatism twenty years ago; was in Sisters' of Charity Hospital in Buffalo, N. Y., with rheumatism for three weeks, and since has not had it, except in wet weather he complains of occasional twinges. Had ulcer on penis twelve years ago. Had malaria for one year, ten years ago. In December, 1895, was in this hospital for one month for injury to ribs. Is a heavy drinker and smokes a great deal. Has pain in right hip and leg, worse on motion; has cough with muco-purulent expectoration for past two months, had hæmoptysis once, no night sweats, losing weight, no dyspnoea, constipated. Physical examination: Inspection: Patient is well developed and well nourished. There is entire absence of expansion over left side. Apex beat not visible. Inspection of right hip negative. Palpation: Increased vocal fremitus all over left lung except low down posteriorly, where it is absent. Apex beat is low down and out from normal position; no tenderness elicited on pressure over hip or course of sciatic nerve. Percussion: Dullness all over left lung. Right lung not hyperresonant. Auscultation: In the infraclavicular and infrascapular regions, left side, can be heard various sizes of moist râles, mostly subcrepitant; occasionally can hear a high-pitched dry râle. Breathing over left lung tubular type. A harsh systolic murmur can be heard over apex when patient is lying down, not heard when standing. Slight accentuation of second sound at left side of sternum. Sputum examined and found to contain a large number of bacilli of tuberculosis. Urine: Alkaline, specific gravity, 1020, no albumen or sugar. Treatment: Extract cascara sagrada fluidum 5 c. c. at night. Creosote, 5 drops three times a day, to be increased gradually. R/ Sodium salicylate 1.00 gram three times a day.

September 4.—Complains of pain in right leg.

September 10.—Pain in leg less severe; salicylate stopped.

October 1, 1897.—Examination of heart: Apex beat displaced upward, and to the left, being one-half inch below and to the left of nipple; beat is strong, but slightly diffused. There is a systolic murmur heard, most loudly 1 inch below and to right of nipple; murmur can not be heard at all posteriorly. Complains of chills in the morning; was given quinine. Condition did not improve to any extent up to January, 1898: was then taking creosote, 10 drops three times a day. Occasionally complained of pains in hip, for which chloroform liniment was ordered. Says he feels weak; lost 5 pounds in weight since admission. R/spiritus frumenti 25 c. c. daily.

March 26, 1898.—Coughs and expectorates a great deal, especially in the morning when he first gets up. Has slight hæmoptysis occasionally.

May 1, 1898.—Complains of soreness of gums; lips and gums are swollen and

ulcerated, and right submaxillary gland is swollen; complains of toothache; decayed tooth extracted; gland painted with tincture of iodine daily and chlorate of potash mouth wash ordered.

May 10.—Mouth well, swelling entirely gone. Urine examined, result negative; creosote was increased until now he receives 40 drops three times a day; agrees with him; weight, 140 pounds; complains of dyspnoea.

June 23, 1898.—Weight, 135 pounds; creosote diminished to 25 drops three times a day; prescription of codeine cough mixture, 5 c. c. every three hours; receives extra diet.

January 1, 1899.—Condition remains practically the same; complains of dyspnoea; occasional rheumatic pains in his hip; has muco-purulent expectoration at times streaked with blood; cough distressing in the morning; weight, 130 pounds. Treatment: Creosote drops 25 three times a day and extra diet.

January 21, 1899.—Complains of pain in thigh and hip, left side. Prescription of sodium salicylate, 1 gram every three hours.

January 24.—Salicylate stopped; pain considerably relieved.

January 30, 1899.—Gradually failing; complains of dyspnoea; respiration labored; pulse weak, but not rapid; lips cyanosed; given strychnine and atropine hypodermically; condition rapidly grew worse, and he died at 5.28 a. m., January 31, 1899.

Necropsy (thirty hours after death).—Body well nourished; 5 feet 8 inches high. Rigor mortis marked. Post-mortem lividity fairly well marked. Pupils equal and moderately dilated. Skull cap of average thickness and shows no evidence of disease. Brain case fair size. Membranes and sinuses apparently normal. Vessels of brain congested. Brain weighed 1,575 grams. On section apparently normal. Thorax: Thymus glands rudimentary; anterior mediastinum negative. Pericardium contains 5 c. c. of pale straw-colored fluid; walls smooth and shining.

Heart, weight, 500 grams; surface has thick layer of fat, especially along borders and at apex; at apex as much as 1 cm. in thickness. Heart is firm and contains considerable amount of post-mortem and ante-mortem clot; section shows all valves competent except anterior mitral, which has considerable fibrous thickening over apex; walls of heart are thick and firm, deep red in color. Great vessels, nerve trunks, and diaphragm negative. Right pleural cavity empty and no adhesion. Right lung weighs 950 grams, floats, crepitates, and surface deeply pigmented. Base deeply congested. Apex shows caseating tubercular nodule. Left pleura adherent almost throughout its whole extent. Left lung weighs 610 grams, floats, and crepitates in lower lobe; upper lobe contains a cavity, size of hen's egg; walls fairly smooth, show some caseating areas, and few miliary tubercles. There are numerous masses of caseous material in upper lobe. Lower lobe has hypostatic congestion. Abdomen, no escape of gas; some clear serous fluid, light yellow in color, amount 500 c. c., in peritoneal cavity. Peritoneum everywhere smooth and shining. Omentum apparently normal. Liver weighs 1,990 grams, feels firm and hard, and surface, particularly of right lobe, is tough and nodular; color pale. Section is hard and gritty, and lobules stand out distinctly, giving nodular appearance; cut section presents appearance of fatty degeneration. Spleen weighs 160 grams; color normal, section soft and friable; congested. Right kidney, weight, 640 grams; length, 2.8 cm.; breadth, 1.6 cm.; thickness, 0.8 cm.; capsule peels readily, leaving surface smooth and shining; section shows retention cysts; surface at section is pale; markings fairly well defined except in center, where cortex and medulla are ill defined. Left kidney, weight, 110 grams; consists of six distinct lobes; each contain a single pyramid, and has a tubular calyx. On section, surface appears congested; markings distinct. Suprarenal capsules apparently normal. Bladder distended with urine; walls apparently normal. Urethra, negative. Testicles, left, atrophied. Prostate and seminal vesicles

apparently normal. Stomach, small intestine, mesentery, large intestine, and gall duct apparently normal.

J. M. K.

G. W. S.

CASE 10.

O. M. O., age 36 years, nativity Norway; was admitted to the United States Marine Hospital, San Francisco, Cal., September 10, and died December 4, 1898.

History.—Patient was discharged improved from this hospital August 29, 1898, having been under treatment for tubercle of the lung, from which he had suffered since 1896. He complained of shortness of breath and palpitation of the heart on slight exertion; was very weak; coughed a great deal and expectorated large quantities of thick, yellow sputum. He had been losing weight very rapidly of late. The patient had a good appetite, but vomited food occasionally, immediately after eating, and was troubled at intervals with diarrhea. He had to pass urine every two or three hours during the day and three times during the night. The quantity of urine was normal for the twenty-four hours. Physically he was a moderately developed but poorly nourished man. The supra and infra claviclar spaces on both sides were depressed. In the right supra-clavicular fossa the veins could be seen to pulsate. The movements of the chest wall were very limited in respiration. On percussion we found the apex of the right lung dull, but a hyper-resonant note was obtained over an area extending from the anterior axillary line to the sternum, and from the clavicle to the fifth rib. Posteriorly the right lung was dull from the apex to the fifth dorsal vertebra. The apex of the left lung gave a flat note, but below the clavicle to the base of the lung, anteriorly, a hyper-resonant note was obtained. Posteriorly the left lung was dull from its apex to the fifth rib. The superficial heart dullness was normal in size and position. Friction fremitus could be felt on the anterior surface of the chest. Bronchial breathing and prolonged expiration were heard over the entire surface of the right side of the thorax. The left lung was the same on auscultation except that bubbling rales were heard over the inferior lobe. The aortic and pulmonic sounds were weak, but the mitral and tricuspid were slightly accentuated. The sputum was examined and the bacillus tuberculosis found in abundance. The patient gradually grew worse, becoming weaker and more dyspnoeic until December 4, when he died at 8.45 p. m.

Necropsy (seventeen hours after death).—The body is that of a moderately well developed but poorly nourished and much emaciated white adult male of medium size. Rigor mortis moderately marked. There are no distinguishing marks on the body. The peritoneum (parietal) is smooth and shining and appears normal. The visceral peritoneum is slightly congested. About 20 c. c. of clear, straw yellow fluid is in the recto-vesical space. The arch of the diaphragm is on a level with the sixth costal cartilage. The pericardium is slightly opaque and a little thickened. It contains 100 c. c. of clear, light-yellow fluid, but presents no evidences of inflammation. The heart feels firm and cuts with normal resistance. The heart muscle appears normal. Its weight is 302 grams; all its valves are found competent, but there is a little thickening of the aortic semilunar segments. The right auricle is filled with fluid blood. The left auricle has some fluid blood, and also contains a large fibrinous clot. The right ventricle contains post-mortem clots. The left ventricle contains both ante and post mortem clots. Both the right and left pleura are adherent to the anterior surfaces of the right and left lungs, respectively, and to the diaphragm. The left lung weighs 727 grams. The apex of the lung is infiltrated with tubercular masses and also contains a mass of fibroid tissue as large as a walnut. On section the entire lung is found infiltrated with tubercular masses, and contains numerous small cavities. One cavity 8 cm. long and 5 cm. in diameter is found in the inferior lobe near its anterior surface. The

bronchial lymph glands are enlarged and caseous. The right lung weighs 827 grams and is infiltrated and contains many small cavities filled with pus, as is the left. At its apex a cavity 5 by 8 cm., irregular in shape and filled with a dirty-yellow pus, is found. The stomach and intestines are normal with exception of appendix vermiciformis, which is bound down by adhesions and which contains several small enteroliths. The kidneys are slightly congested, but otherwise normal. The left kidney weighs 182 grams and the right 160 grams. The spleen is very much enlarged, and its consistency hard. It weighs 412 grams. The liver is normal in appearance. Its weight is 1,885 grams. The gall bladder is full of bile, and the duct of the gall bladder contains a small stone. The pericranium is normal, but somewhat thin. The skull itself appears normal. The dura mater is slightly injected. Between the membranes of the brain at its base is found a small amount of clear fluid (10 c. c.). The surface of the brain itself is normal, and on section nothing out of the ordinary can be seen. It weighs 1,300 grams.

T. B. P.

J. M. G.

CASE 11.

Extensive ulceration of large intestines.

J. M., aged 38 years; nativity, Kentucky; admitted to United States Marine Hospital, Chicago, Ill., April 7, 1898; died January 1, 1899.

History.—Patient on admission complained of diarrhea of at least one year's standing. Sometimes bowels would move fourteen to eighteen times a day and then would be better for a time, and the diarrhea would again return. He remained in the hospital until May 30, 1898, when he was discharged much improved, but was readmitted November 2, 1898, in a much worse condition, complaining principally, as before, of diarrhea. The diarrhea continued, the patient gradually became exhausted, and died January 1, 1899.

Necropsy (fourteen hours after death).—Post-mortem lividity and rigor mortis slight. Brain weighed 1,540 grams. It and its membranes appeared normal. The heart weighed 230 grams. Heart and pericardium were normal. Left lung weighed 610 grams, right lung 580 grams. Tubercles were disseminated throughout both lungs and small cavities were in each apex. Pleura very firmly adherent over entire right lung. Great vessels, nerve trunks, and diaphragm apparently normal. Omentum normal. Spleen weighed 210 grams and two cheesy, yellowish nodules were found in its substance. Left kidney weighed 90 grams, was very pale in color, capsule firmly adherent, kidney substance very firm, and numerous small cyst-like cavities were seen. Cortical portion very thin. Right kidney weighed 230 grams and was apparently normal. Suprarenal capsules, urinary bladder, and organs of generation apparently normal. Stomach, gall ducts, pancreas, and solar plexus apparently normal. Liver weighed 1,860 grams and appeared normal. Small intestines were slightly congested. Large intestine presented marked ulceration and necrosis throughout its whole extent. In many places the mucous membrane was absent, and at one point the ulceration had extended through all the coats except the peritoneal. At one point in the rectum the ulcer had perforated the intestine and caused a fistula in ano, which had opened externally before death. The mesentery contained large and cheesy lymphatic glands.

D. E. R.

H. W. S.

CASE 12.

M. B., aged 41 years; nativity, Finland; was admitted to the United States Marine Hospital, New York, N. Y., November 29, 1898; died January 19, 1899.

Family history, negative. Antecedent history: Had gonorrhea fifteen years ago; chancres eight years ago; was in this hospital eight years ago for one month with

rheumatism, and one year ago was in a hospital at Philadelphia for eleven days with chills and fever; six months ago was operated on in this hospital for ischial abscess. Present history: Has cough, distressing during the night, with mucopurulent expectoration, night sweats, dyspnoea on exertion, feels run down and weak, has lost 25 pounds in weight, throat is sore, voice hoarse, deglutition somewhat painful, etc. These symptoms and loss of weight date back about one year. Physical examination: Inspection; skin pallid, rough, and nonelastic; supra and infra claviclar spaces retracted; respiration labored; throat inflamed. Palpation: vocal fremitus increased over both lungs. Percussion: Highest pitch over left apex. Auscultation: Moist and dry râles heard over lungs, more especially over upper lobe of left lung, where whistling râles are also present. Heart's action increased. Treatment: Creosote, 5 drops three times a day; oleum morrhue and malt, 5 c. c. three times a day; turpentine inhalations.

December 3.—Turpentine irritates throat—stopped, and terebene gtt. 5 twice daily, substituted.

December 8.—Throat much better—night sweats profuse. Atropine, 0.0006 at 8 o'clock p. m., prescribed.

December 16.—Throat examined; diagnosis of laryngitis acute made.

December 21.—Specific history elicited; put on mixed treatment 5 c. c. three times a day.

December 25.—Condition unimproved; mixed treatment nauseates him: has reduced to 3 c. c. three times a day: eats little and feels weak.

December 28.—Complains of pain over third and fourth ribs to left of sternum; mustard plaster ordered.

January 5.—Unimproved; appetite poor; R/ Elix. ferri, quiniæ, et strychnine phos. and sirup of hypophosphites aa 50 c. c.; Sig. 5 c. c. three times a day, before meals; extra diet; stop atropine.

January 8.—Feels fairly well; no night sweats for last five days.

January 10.—Complains of dyspnoea and sore throat; insufflations of iodoform tried; too irritating to continue.

January 12.—No improvement; mixed treatment stopped.

January 13.—Cocaine spray ordered.

January 14.—Complains of pain in left side, about tenth rib, and of intense dyspnoea; respiration, 28; pulse, 120; temperature, 39.

Examination: Respiration rapid and superficial; expansion increased on right side, diminished on left side: slight bulging on left side. Palpation: Fremitus diminished over left side, below eighth rib, slightly increased over right side. Percussion: Flat over left lower lobe. Auscultation: Breathing over lower left lobe absent; over upper lobe, bronchial in character; sonorous, crepitant and subcrepitant râles over right lung and upper part of left lung. Hot applications over left side. Prescription of strychnine sulphate 0.002 every two hours; spts. frumenti 20 c. c. every two hours. Cathartics: Calomel. enema. Condition was extremely poor; dyspnoea marked; pulse feeble; temperature zigzag. Condition rapidly became worse; following day became semiconscious, irrational, and lingered along until January 19, when he died of respiratory failure.

Necropsy (two hours after death).—Body warm, fairly well nourished; no post-mortem marks: rigor mortis not yet set in; some syphilitic scars over inner surface of legs. Skull cap about twice its normal thickness: brain case small; sinuses filled with blood; vessels injected; no gross lesion of their walls evident; on peeling the dura mater away, the membranes were found adherent in three spots, each about the size of a 10-cent piece: two spots on left and another on right of longitudinal fissure, about its center. Weight of brain, 1,500 grams. No marked lesions found. Thorax: Anterior mediastinum—relations somewhat disturbed at base by heart and pericardium being pushed about three-fourths of an inch to right by fluid

in left pleura—otherwise normal. Thymus glands rudimentary. Heart displaced about three-fourths of an inch to right, and extends downward under ensiform cartilage; hypertrophied, weight 425 grams; endocardium normal; no valvular lesion. Pericardium also displaced somewhat to right: normal in other respects. Right lung: Floats, crepitant, weight, 670 grams, small tubercle found in apex and several tubercles found scattered through the middle and lower lobes. Tubercle at apex showed beginning caseation. Left lung in state of atelectasis; does not crepitate, does not float: weight, 970 grams; apex adherent to parietal pleura and large tubercle in state of caseation found, also tubercle at lower edge of lobe. Right pleura, normal. Left pleura contains about 800 c. c. of serous fluid which did not coagulate; walls of pleura thickened from about 0.5 to 1 cm.; numerous adhesions exist between parietal and visceral layers. Great vessels, nerve trunks, and diaphragm normal. Abdomen: Omentum, normal. Spleen, weight, 270 grams, markings normal. Right kidney, weight, 250 grams, capsule nonadherent, markings normal. Left kidney, weight, 275 grams, capsule nonadherent, markings normal. Suprarenal capsule, normal. Urinary bladder contains about 50 c. c. of urine, walls slightly thickened. Prostate gland somewhat enlarged. Seminal vesicles and testicles show no gross lesion. Penis indurated, scars at cervix of glands to left of frænum. Urethra, no marked lesion. Rectum: Empty, normal. Duodenum shows no gross lesion. Stomach distended with gas and contains undigested food. Gall ducts normal. Liver enlarged, congested, weight, 2,290 grams. Pancreas normal. Solar plexus and mesentery apparently normal. Small intestines show no marked lesion. Large intestines distended with gas: sigmoid flexure contains hardened fecal matter; walls of intestines show no lesion. Spinal cord not examined. Larynx examined: Mucus membrane thickened, soft, and in condition of catarrhal inflammation, with purulent discharges covering its surface. Vocal cords thickened and ulcerated at edges.

J. M. K.

G. W. S.

CASE 13.

R. K., aged 38 years; nativity, Illinois; admitted to United States Marine Hospital, St. Louis, Mo., April 10; died June 18, 1899.

History.—The patient's sickness began with a severe cold one year ago. Since that time he has had more or less pain in his chest and abdomen, cough, and shortness of breath. His father died from asthma, but none of his other relatives have suffered from diseases of the chest. During the last two months he has been losing flesh and his cough and other symptoms have been worse. He has difficulty in holding his water and has to have a urinal constantly by him; passes his water freely. He has to drink a great deal of water, as he feels thirsty most of the time. He had gonorrhea in 1892, but has never had syphilis. He frequently has night sweats. He has never had a hemorrhage from his lungs, but has passed blood from his bowels. Physical examination: Body emaciated: eyes bright, but sunken; cheeks flushed, skin hot; depression above clavicles: sternum and scapulae prominent; respiratory movements restricted in upper part of chest, the breathing being principally abdominal; vocal fremitus increased over both apices: dullness on percussion over apices of both lungs: mucous rales heard over the upper part of the chest, more especially on the right side; breath sounds broncho-vesicular; murmur heard over the apex of the heart: pulse 128, weak; respirations 32, temperature 38.5; expectoration profuse, contains the tubercle bacilli in large numbers; specific gravity of urine 1.003, reaction faintly acid, light amber color, a trace of albumen present, amount passed in twenty-four hours, 6 liters; bowels constipated; appetite poor. The patient continued to have fever and his pulse and respirations were rapid until the day of his death. His cough was very severe at times, interfering with his sleep. He became extremely emaciated, and died from exhaustion on June 18, at 1 p. m.

Necropsy (twenty-two hours after death).—Height, 185 cm. Scalp bound down tightly to skull; thickness of skull at occiput, 9 mm. Cerebral membranes in good condition. Weight of brain, 1,420 grams; greatest length, 20 cm.; width, 12½ cm.; thickness, 8 cm.; color, externally dull white; interior of cerebrum normal; width of cerebellum from side to side, 11 cm.; width antero-posterior, 6 cm.; interior normal. Thickness of abdominal wall, 1½ cm.; intestines of a grayish pink color, filled with gas. Mesenteric glands very much enlarged. Lungs bound down to thorax and to pericardium: 25 c.c. of fluid in pericardial sac. Heart: 10 by 9 by 3 cm.; weight, 360 grams; right ventricle filled with clots; valves normal; leaves of mitral valve contained a number of small nodules. Left lung: 26 by 15 by 6½ cm.; weight, 1,070 grams; reddish gray in color, hard, non-crepitant, filled with tubercles throughout. Right lung: 15 by 14 by 7½ cm.; weight, 940 grams; condition the same as left lung. Left kidney: 11 by 6 by 2½ cm.; weight, 156 grams; width of cortical portion, 9 mm.; pelvis filled with fatty tissue; cortical portion of a reddish color, with whitish-yellow streaks extending from periphery to pyramids. Right kidney: 12 by 8 by 3 cm.; weight, 195 grams; width of cortical portion, 1 cm.; color of cortical portion reddish, with yellowish-gray streaks; width between pyramids, 1 cm. in places; pyramids small; pelvis contains fatty tissue. Spleen: 15½ by 10 by 3 cm.; weight, 270 grams; tissue soft, chocolate color internally, numerous white spots being also visible. Mucous membrane of stomach and small intestine grayish-yellow color. Liver: 28 by 18½ by 4½ cm.; weight, 1,770 grams; color dark red, tissue firm.

W. G. S.

CASE 14.

J. E., aged 39 years; nativity, Finland; was admitted to the United States Marine Hospital, San Francisco, Cal., December 21, 1898, and died January 10, 1899.

History.—Had never been sick before. His illness began one year ago with a severe cold. Since that time he had had a cough and raised a thick yellow sputum. He had lost very markedly in weight and felt very weak and languid. He had severe sweats at night and complained of being dyspnoeic both at rest and on slight exertion. On physical examination, we found a fairly well developed but much emaciated individual of medium size. The supra and infra clavicular spaces were sunken and the chest was somewhat barrel-shaped. On percussion, dullness of the upper lobes of both lungs was found. The dullness extended on the right side in front to the second rib and on the left side to the fifth rib. Bronchial breathing was heard over these areas. It was also heard over a small area in the inferior lobe of the left lung. Patient grew weaker constantly and died January 10, 1899. Treatment consisted in the administration of creosote and stimulation. Nourishing foods were given and a mixture to allay the cough.

Necropsy (seven hours after death).—Rigor mortis is present. Body is that of an adult white male of medium size, fairly well developed, but poorly nourished. The peritoneum is normal. The omentum is well developed and filled with yellow fat. The intestines are somewhat distended, but appear normal. The pericardium is covered with fat on its anterior surface. Its internal surface is smooth and its cavity contains 60 c. c. of clear fluid. The heart is slightly enlarged and its surface congested; weight, 302 grams; valves normal. The coronary veins are full. The wall of the left ventricle is thickened. The left ventricle contains a small amount of fluid blood. The right ventricle contains an adherent fibrinous clot. The right auricle is much dilated and is filled with a white elastic clot and some fluid blood. Left auricle is filled with fluid blood. The lungs are pigmented in spots and their exterior surface presents a "granite" appearance. They are both adherent to the thoracic wall over their entire surfaces. The left lung weighs 670 grams. On section it is seen generally infiltrated with tubercular masses. In the

superior lobe two cavities are found, each about 4 cm. in diameter, irregular in shape, and filled with a thick yellow pus. The right lung weighs 1,040 grams. Its superior lobe is entirely occupied by a large cavity. The middle lobe contains several small cavities, and the inferior lobe is consolidated on its posterior surface. The spleen weighs 370 grams and is somewhat enlarged. Its capsule strips normally and its cut surface appears normal. The left kidney weighs 175 grams and the right kidney weighs 215 grams. In the left kidney bands of yellow fat are found extending between the pyramids. Both kidneys are light colored and answer the reaction for amyloid degeneration. The capsules strip easily. The liver is enlarged and weighs 2,337 grams. It is congested, but on section appears otherwise normal. The pancreas weighs 114 grams and is normal. The brain weighs 1,380 grams and is normal. The dura mater is a little thickened, but not adherent, and shows no tubercles.

T. B. P.

J. M. G.

CASE 15.

J. H. (colored), aged 28 years; nativity, Florida; admitted to the United States Marine Hospital, Boston, Mass., January 7; died February 8, 1899.

History.—Family history negative. Had malarial fever seven years ago. Denies venereal history. Was operated on for abscesses in right clavicular, right costal, sternal, and sacral regions two and a half years ago. States duration of present illness as three months, and that previously he was perfectly well. Onset was sudden. Contracted a cold from getting wet, and next morning found right leg useless. Has suffered sharp shooting pains in right knee and hip, which are greatly increased by motion. Has had a cough, which is worse during the day, for the last six or seven weeks. Expectoration at first was abundant, but at present is scanty. Denies hæmoptysis or night sweats. Has lost much flesh recently. Has œdema of feet and ankles. Micturates two or three times during the night. Physical examination: Appearance emaciated and anæmic. Skin dry and harsh. Nails club-shaped. Slight papular eruption on face. Tongue pale and indented on sides by teeth. Presents scars over sternum, right clavicular, right costal, and sacral regions, caused by previous operations. Percussion note dull over whole of right lung, over apex of left lung posteriorly and upper lobe of left lung anteriorly. Auscultation gives prolonged respiratory sounds and increased vocal fremitus over whole of right lung and harsh and jerky respiratory sounds over apex of left lung. The right lower extremity is much atrophied, with function of hip and knee joint impaired and pain on motion. There is a large fluctuating tumor on external aspect of right thigh, extending from the trochanter major to the middle of the thigh. The inguinal glands on the right side are enlarged. Temperature on admission, 37.6° C. On January 8 tumor was aspirated and about 500 c. c. of pus and cheesy matter withdrawn from abscess, and compress applied. Examination of sputum showed tubercle bacillus. Urinary analysis was negative. Temperature ranged from 36.5° C. to 39° C. until death, with regular evening exacerbation. Cough was most distressing, and disease progressed steadily, resulting in death at 9 a. m., February 8, 1899.

Necropsy (two hours after death).—Body emaciated; rigor mortis absent; pupils equally dilated. Pericardial sac contained about 200 c. c. of straw-colored fluid. Heart weighed, after opening, 310 grams; valves were all competent. Left lung weighed 1,170 grams; its upper lobe was consolidated and its apex contained a cavity; its lower lobe was not involved and presented an accessory lobe. Right lung weighed 1,050 grams; its upper and middle lobes were consolidated; its apex full of cavities. All the lymphatic glands in the thoracic cavity were enlarged. Position of abdominal viscera was normal. The mesenteric glands were much enlarged. Liver weighed 2,250 grams, and displayed evidence of fatty degenera-

tion. Left kidney weighed 175, right 170 grams; both were pale and showed signs of fatty degeneration. Spleen weighed 270 grams, was adherent to liver, and contained tubercular foci. Pancreas weighed 126 grams. Brain weighed 1,370 grams; it and its meninges were normal. The abscess on external aspect of right thigh contained yellowish pus.

F. I.

CASE 16.

F. C., aged 46 years; nativity, Germany; was admitted to the United States Marine Hospital, San Francisco, Cal., January 7, 1899.

History.—Family history negative. He had chancre sixteen years ago and gonorrhea ten years ago. His present illness began four years ago. At that time he contracted a cold, from which he never fully recovered. He would feel well for a time and then would relapse into the old trouble. He had a cough with which he raised a thick yellow viscid sputum, and which was worse in the morning. Had lost greatly in weight and felt very weak. He had no night sweats. He was dyspnoic on slight exertion and complained of continual chilly sensations. He was very much emaciated and in a state of great exhaustion when admitted. On percussion we obtained a flat note from the apex of the left lung to the fifth rib in front and to the fifth dorsal spine behind. The right lung was flat from the apex to the third rib. A cavity was noted beneath the third and fourth costal cartilage on the right side. Bronchial breathing was heard over the superior lobe of the right lung and over the entire left lung. Supra and infra clavicular spaces were much sunken.

Treatment.—A sedative cough mixture was given and whisky as a stimulant. A mixture of cod liver oil, malt, and whisky was given as food, in addition to milk diet.

Patient rapidly grew worse and died January 7, 1899.

Necropsy (twenty-one hours after death).—The body is that of an emaciated adult, white male, of medium size. No external marks of note are present. The parietal peritoneum is normal. The peritoneal cavity contains 100 c. c. of clear fluid. The intestines are somewhat distended and are studded with miliary tubercle. In the mesentery the glands are enlarged and the entire mesentery is tubercular. Tubercular ulcers are scattered throughout the entire length of the small intestine. The liver weighs 1,340 grams. Its capsule is thickened. Its cut surface is granular and somewhat pale. The pancreas weighs 50 grams, and is normal. The left kidney weighs 185 grams and the right 170 grams. They are both normal. The spleen weighs 160 grams, and is normal. The pericardium is adherent to the left lung. It contains 10 c. c. of clear fluid, with a small amount of fibrin at the bottom. The heart appears normal on its external surface. Its substance, however, tears easily, and is abnormally light in color. Its valves are all competent and its cavities filled with blood. It weighs 205 grams. The left lung weighs 1,080 grams, and is attached to the chest by numerous old adhesions. It is felt to be infiltrated with tubercular nodules. The apex contains numerous very small cavities. The right lung weighs 760 grams. It is generally adherent to its posterior surface, and is filled with tubercular infiltration. It has a cavity in its middle lobe 10 c. c. in diameter. In its inferior lobe an old scar is present showing the site of a healed cavity. The brain weighs 1,320 grams, and is normal.

T. B. P.

J. M. G.

CASE 17.

E. M., aged 35 years; nativity, Sweden; was admitted to the United States Marine Hospital, San Francisco, Cal., December 21, 1898, and died February 3, 1899.

History.—Family history negative. About seventeen years ago he had a diar-

nine years ago. He had used alcohol and tobacco to excess. Eleven months ago he contracted a cough which persisted and was accompanied by a thick, yellow, viscid expectoration. The cough was worse at night. During the last six months he had lost weight. Two months before admission to hospital he had chills every day, accompanied by fever. They came on irregularly, but generally at night. On examination of the thorax, the physical signs of phthisis were found and tubercle bacilli found in the sputum. The patient was confined to his bed the whole time he spent in this hospital, and grew progressively weaker until February 3, 1899, when death occurred. Treatment consisted of creosote and whisky, placebos for cough, and abundant, easily digestible diet.

Necropsy (ten hours after death).—The body is that of a fairly developed but much-emaciated white adult male, of medium size. Rigor mortis is present and post-mortem lividity is marked in dependent parts. The parietal peritoneum is normal, but in the visceral layers numerous small tubercular growths are present. The peritoneal cavity contains 250 c. c. of fluid, suspended in which are a few fibrin flakes. The outer surface of the pericardium is normal, and the inside is smooth and shining. It contains 90 c. c. of clear fluid. The heart contains an excess of fat on its surface and the muscle itself is flabby and soft from fatty degeneration, the right auricle is full of fluid blood, the left auricle contains some fluid blood and a white clot, the right ventricle contains fluid blood and a white clot, the left ventricle a small amount of fluid blood, and the valves are all competent. It weighs 260 grams. The left lung weighs 1,030 grams. In the left apex is a cavity 10 centimeters in diameter and occupying the entire apex. Smaller cavities are scattered throughout this lung and between them are areas of consolidation. The right lung weighs 1,230 grams and contains numerous small cavities filled with pus. The lower lobe is in a state of hypostatic congestion. Both lungs are adherent to the thoracic walls. The spleen weighs 380 grams and numerous tubercles are in its capsule. The left kidney weighs 190 grams. Its capsule strips easily. The cortex is thickened and pale. The pyramids are very pale. The right kidney presents the same appearance as the left and weighs 185 grams. The liver weighs 1,880 grams. It is somewhat congested and the veins are full of blood. The substance proper is a little paler than normal. The intestines are studded with tubercular growth in the peritoneum. On the internal surface of the small intestine numerous tubercular ulcers are found. The pancreas is somewhat hard in consistence and weighs 90 grams. The vermiform appendix is bound down by peritoneal adhesions. Bladder, prostate, and rectum are normal. The brain weighs 1,425 grams. The dura mater is thickened and adherent to the calvarium. The lateral ventricles contain an excess of serous fluid.

H. A. S.

J. M. G.

CASE 18.

K. M.; aged 40; nativity, Cape Breton; admitted to the United States Marine Hospital, Boston, Mass., May 25, 1898; died September 6, 1898.

History.—On admission patient could give no definite family history; had taken a severe cold three months before and had had a cough ever since. Ten days previous to admission was taken sick while at sea with chills, followed by sweats and fever, and has been sick ever since. His bowels are constipated, urine scanty and red, has lost much flesh, and feels very weak; has night sweats and spells of violent coughing, which are worse at night; complains of a catching pain in chest on deep inspiration; tongue coated, pulse weak, temperature 37.9°. Physical examination revealed a cavity in the upper left lobe and a harsh respiratory sound over the right lung; sputum contained the tubercle bacillus. Under treatment the cough improved and the patient seemed to feel generally better. He had during his entire stay in the hospital a regular evening rise of temperature, ranging from

37.6° to 39.8°, his morning temperature staying between 37° and 38°. For a month he complained of feeling very weak, but after that time, until August 1, he said he felt better, and on fine days would get out in the fresh air in a wheel chair. For the first three weeks his bowels were constipated, but afterwards became loose, and he continued to have a tendency to diarrhea for the rest of his illness. From the 1st of August on he had every four or five days spells of weakness, from which he would rally and seem to feel much better. August 13 his cough began to trouble him again and his breathing became labored. Emaciation progressed steadily and dyspnoea and cough increased. Died September 6 at 1.20 a. m.

Necropsy (ten hours after death).—Post-mortem lividity and rigor mortis slight; much emaciated; pupils dilated. Heart weighed, after opening, 220 grams; pericardial sac contained 40 c. c. of straw-colored fluid; pulmonary valve incompetent; fatty degeneration of cardiac muscle; right ventricle dilated and its walls thinner than normal. Left lung was a semifluid, gangrenous mass, its central portion entirely destroyed by the tubercular process, so that it could not be removed without breaking it up; right lung weighed 790 grams; nodules could be felt throughout the upper lobes; on section there was found a cavity in the apex about the size of a walnut; tubercular nodules throughout the lung, some of which had undergone caseous degeneration. Stomach contained 25 c. c. of yellow fluid, with a little curdled milk. Intestines normal. Liver weighed 1,300 grams; color, reddish brown; apparent increase of connective tissue; gall bladder and ducts normal. Pancreas weighed 115 grams and presented a normal appearance. Left kidney weighed 160 grams; cortex wider than normal; a few fine red spots seen on section; right kidney weighed 156 grams; similar red spots seen on section and a few small miliary tubercles under capsule. Bladder, urethra, and prostate normal. Suprarenal bodies showed marked degeneration and had miliary tubercles under the capsules. Spleen weighed 100 grams, was small in size, and exhibited an increase of connective tissue. Head, scalp, and skull normal. Dura mater was adherent along the anterior portion of the longitudinal fissure. Brain weighed 1,370 grams. There was a small number of caseous tubercles on the surface of the brain.

F. I.

CASE 19.

B. S. (white); aged 50; nativity, Wisconsin; admitted to marine hospital, St. Louis, Mo., June 24, 1898; died October 15, 1898.

History.—Bad cough for two months, with muco-purulent expectoration, pain in chest, and weakness. Examination showed tubercular involvement of the apices of both lungs and a cavity of right lung below the middle of clavicle. Family history negative. Patient exhibited from day to day the typical symptoms of pulmonary tuberculosis—cough continued severe, expectoration did not decrease in quantity, shortness of breath developed, and at times became severe. Digestion remained fairly good, suffered little from nausea or vomiting; appetite was capricious; no diarrhea; fever ran a typical course, higher in the evenings than in the mornings; night sweats were continuous and difficult of control. Patient gradually became weaker and died of exhaustion. Treatment: The treatment was directed to alleviating the cough and decreasing the night sweats, and use of creosote in increasing doses, and oil and malt. In the latter stages morphia was given for the paroxysms of dyspnoea. Aromatic sulphuric acid and atropine were used for the night sweats with variable success.

Necropsy (eight hours after death).—Rigor mortis present; great emaciation; superficial view of abdomen normal; peritoneum healthy. Capsule of spleen peels easily; spleen pulp tears easily, weight 152 grams. Each kidney weighs 137 grams, and is normal. Liver weighs 1,450 grams and normal, including capsule and gall bladder. Mesenteric glands enlarged. Heart, left ventricle filled with fluid blood,

superficial veins slightly distended, post-mortem clot in arch of aorta; weight of heart 320 grams; right portion of heart fatty, with flabby walls; right coronary artery has two openings into aorta. Lungs adherent; weight of left lung 650 grams, left lower lobe partly consolidated, upper lobe consolidated, with several cavities; right lung practically in same condition, but so tightly adherent that it could not be removed. Brain normal, weight 1,320 grams, but meninges adhere to cortical structure in one or two places; a great amount of ventricular fluid. Stomach and intestines normal; ureter and bladder normal.

H. H.

CASE 20.

C. A. (colored); aged 48; nativity, Maryland; admitted to the United States Marine Hospital, Cincinnati, Ohio, March 24, 1899; died May 11, 1899.

History.—Present illness began six months before admission; complained of pain in chest, cough, night sweats, and general weakness. Family history negative; denied syphilis. Physical examination: Patient very much emaciated, throat congested, partial aphonia, chest poorly developed, marked depressions in supra and infra clavicular regions, expansion very much lessened on left side. Marked dullness over left lung, with a cracked-pot resonance over upper lobe; dulness was present over right lung at apex and below clavicle. Bronchial breathing on both sides, bubbling râles on left side, and amphoric respiration over left upper lobe anteriorly. Sputum loaded with bacilli; temperature 39°. Patient gradually grew weaker, and died May 11, 1899, at 10 a. m.

Necropsy (five hours after death).—Rigor mortis present; emaciation marked. Brain normal; weight 1,240 grams. Chest: Pleural cavity contained 200 c. c. of fluid. Pleura adherent to chest wall throughout. Left lung at upper lobe was one large cavity, and there were several small cavities disseminated throughout lung; weight 540 grams. Right lung, pleura nonadherent, upper lobe showed tubercular deposits, lower lobe in state of hypostatic congestion, weight 1,200 grams. Pericardium contained 150 c. c. of fluid, otherwise normal. Heart, weight 420 grams; valve normal. Liver apparently normal, weight 1,620 grams. Spleen soft, weight 190 grams. Right kidney normal, weight 164 grams. Left kidney, capsule adherent, weight 182 grams. Mesenteric glands were enlarged and caseous. Small intestines congested throughout.

J. W. S.

CASE 21.

E. J. (colored); aged 31; nativity, Kentucky; admitted to the United States Marine Hospital, St. Louis, Mo., July 5, 1898; died September 25, 1898.

History.—Sickness began with a "bad cold" the previous winter, accompanied by expectoration of blood, which has continued at intervals since. Has lost weight gradually; at present, emaciated and weak, cough severe, considerable dyspnoea, pain in right side of chest; night sweats. Previous history, negative; family history, negative. Physical examination shows tubercular involvement of both lungs, most marked on right side. Treatment given was creosote in increasing doses, and atropine for night sweats. After a few days, the night sweats were relieved, but from time to time recurred. The fever ran a constant, irregular course. The patient gradually lost strength, showed no marked change for the better at any time, and died September 25, two months and twenty days after admission.

Necropsy (three hours after death).—No rigor mortis. Abdominal organs in their normal positions. Intestines inflated and prominent. No foreign bodies. The parts exposed of a passive congested appearance. Diaphragm reaches lower border of fifth rib. The contour of the lungs was irregular, with tubercular masses and multiple abscesses, particularly in left lung, projecting from the sur-

faces. The lungs were more or less uniformly of a bluish color, ranging to a lighter blue, with the yellowish abscess fluid here and there apparent in the superficial lung substance. The right lung showed some fibroid changes in and around root of lung and extending downward along inner border of lower lobe. The lobes were irregular with bulging here and there. Consolidation was generally marked and the lung was tough in places where an incision was made into the structure. Weight of lungs, right lung 1,250 grams, left lung 700 grams. The pleura was adherent nearly throughout. It adhered to the sternum, ribs, partially so to the pericardium, and in some places caused the lobes to adhere. It was thickened and of a dark red color. Emphysema in some of the superficial air cells. Some crepitation was heard in manipulating the lungs. Heart was of normal size, rigid and firm. The right auricle was distended with blood and both the ascending and descending venæ cavæ. The aorta was of normal caliber and thickness. A thin cloudy nontenacious fluid was found posteriorly in the pericardial sac, in amount about 8 c. c. Weight of heart 250 grams. The spleen of a dark bluish slate color; of normal consistence, slightly enlarged, and weighed 195 grams; capsule peeled off easily. Left kidney of mottled brown and terra cotta color; decreased somewhat in size, soft, and pliable. Cortical structure narrowed, and aspect of internal structure generally homogeneous. Weighed 130 grams. Right kidney very much same as left; capsule adherent in places, and kidney so soft that some came away with capsule on attempting to peel. Evidences of fatty degeneration apparent by oily appearance and yellowish white areas. Weighed 135 grams. Bladder somewhat distended, urine translucent and amounting to 500 c.c. Urinalysis negative. Stomach contracted and empty, some venous congestion. The intestines apparently empty but distended with gas, having a semicadaveric musty odor. Liver normal in size but altered somewhat in shape; soft and easily cut, of a deep dark red color, and in section appears homogeneous except for evidences of slight fatty degeneration; weighed 1,430 grams. Capsule in some places tore off liver substance. Gall bladder filled and of moderately greenish color. Bile thick and ropy, of a dark, almost black color. The duramater, somewhat thickened and in places softened, in others adherent to brain, was of varying shades of salmon. No injection. The superior longitudinal sinus was engorged with a dark fluid blood. Sulci of brain not very deep and gray matter small in amount. On right side of under part of brain in middle fossa a ventricular fluid, mixed with very fluid blood to a small extent, filled a portion of this cavity. Pia mater adherent almost throughout, and thickened; in parts of subarachnoid space slight liquid effusions were found. Brain large and generally boggy, particularly at basal portions, where the consistency resembled mush. The cerebral ventricles contained a slight amount of clear not sticky fluid, with a slight admixture of fluid blood. No clots. White substance pale but moist. The cerebellum broke down under the touch. Pons pale and soft. The medulla oblongata firm and somewhat congested. The appearance of base of internal surface of skull showed a thickened yellowish white appearance of the covering membrane, with collections of fluid, and some dark blood escaped from the vessels during the examination.

H. H.

H. S. F.

CASE 22.

P. R., aged 50 years; nativity, Scotland; admitted to the United States Marine Hospital, Detroit, Mich., May 31, 1898; died December 6, 1898.

History.—On admission to hospital patient stated that he had suffered from an attack of pneumonia during the previous winter and from pain in region of heart for several months past. Present illness dates from exposure three weeks before admission, since which time patient has had slight cough and pain over entire

chest. Physical examination showed dullness in right infraclavicular region, with increased fremitus, and small mucus râles over both lungs. Heart rapid; first sound shorter and less distinct than normal. Veins of arm prominent. Laryngeal examination showed small tubercular ulcer just above left vocal chord. Sputum contained tubercle bacilli, streptococci, pus cells, and leucocytes. Patient placed on increasing doses of creosote, and larynx insufflated with iodoform daily. On September 9 patient had an attack of acute pleurisy, involving lower lobe of right lung, and since that time has had several small hemorrhages. Patient died at 4 a. m. December 6, from hemorrhage.

Necropsy (eighteen hours after death).—Rigor mortis well marked; body well nourished; good muscular development. Bloody discharge from nose and mouth on pressure upon chest wall. Brain and membranes apparently normal: mediastinal lymph glands enlarged; about 200 c.c. of sanguinous fluid found in right pleura. Right lung firmly adherent to pleura at apex and base posteriorly, and recent adhesions at apex of left. Pericardium closely adherent to entire surface of heart and containing no fluid whatever; heart about normal in size; valves in fairly good condition, heart muscles showing fatty degeneration. Right lung congested; well-marked tubercular deposits in upper and lower lobes; small cavity in upper lobe and two of about same size in lower. Left lung also congested, its bronchi and alveola being filled with fluid blood; small tubercular deposit at apex. Aortic arch presented a tubulated aneurysm, the dilatation beginning just above aortic valves and extending throughout arch. Other organs apparently normal.

L. D. F.

J. G.

CASE 23.

Tubercle of intestines.

J. R., aged 47 years: nativity, Portugal; was admitted to the United States Marine Hospital, port of San Francisco, Cal., September 8, and died October 11, 1898.

History.—About a year ago the patient first noticed a pain in the right side of the chest, made worse by a deep inspiration. He began to have a cough, which was not troublesome at first, but gradually grew worse. He gradually lost in weight and strength. He says he has lost 30 pounds in weight during the last two months. The patient has had night sweats for the last four months. He complains of loss of appetite and says that whenever he eats he has a feeling of heaviness in the stomach and vomits something after each meal. The patient has had diarrhea for the last twelve days. He is very weak; complains of shortness of breath on the slightest exertion. He also complains of a chill each day at 9 a. m., followed by fever (the patient has been sailing in a malarial district). Physical examination shows a fairly well-developed but poorly nourished individual. The chest is perfectly flat. Both sides move equally on respiration, but the movement is somewhat limited. Over the right lung the dullness extends upward to the apex from the second rib at the junction with the sternum and the third rib in the mid-axillary line. Bronchial breathing heard as low as the seventh dorsal vertebrae; it is very distinct in the infra and supra clavicular regions. Bubbling râles are heard in the lower part of axillary region. Sonorous breathing heard at the apex and harsh breathing over the rest of the lung. The left lung normal on percussion, except that it shows fluid on a level with the eighth rib in the axillary line. Harsh breathing heard all over the surface of the lung, almost bronchial in character. No râles heard over left lung. Heart sounds are normal. The liver dullness is normal. The spleen extends outward to the mid-axillary line, downward to the lower border of the ribs, and upward to the tenth dorsal vertebrae.

Tubercle bacilli were found in the sputum.

diarrhea, in intestinal sepsis, expectorants, and stimulants. In spite of all treatment the patient grew worse; at times he became delirious and was given morphia in small doses to procure rest. The patient died at 10 p. m., October 11, 1898.

Necropsy (eighteen hours after death).—The body is that of a fairly developed, greatly emaciated, middle-aged white male. Rigor mortis is present. The peritoneum is emphysematous. The intestines are moderately distended with gas. The gall bladder is partially filled, and the surrounding tissues are stained with bile. The omentum contains a very small amount of fat. The mediastinal tissues are emphysematous. The left lung is adherent to the chest wall. The pleural cavity is empty. The pericardium is smooth, pale, and contains 10 c. c. of straw-colored fluid. The heart is normal in size; weight, 270 grams. The left side of the heart is firmly contracted; the right side is contracted, but not so firmly as the left. There are signs of fatty degeneration in the upper part of the right ventricle and in the interventricular groove. The cardiac vessels are congested. The larger blood vessels are empty. Both auricles contain small amounts of post-mortem clot. Both ventricles are empty. The pulmonary artery contains an ante-mortem clot. The aortic valves stand the hydrostatic test. There is a slight calcareous deposit in the wall of the artery at the base of the valve. There is a small fibrous clot on the under surface of the tricuspid valve. The margin of the mitral valve is somewhat roughened. The pulmonary semilunar valves are normal. The heart muscle is normal. The left lung is firmly adherent to the diaphragm; the adhesions to the chest wall are easily broken up. The surface of the lung is mottled. The upper lobe and about half of the lower lobe are consolidated, and on section are found filled with tubercular nodules and tubercles. The lower half of the lower lobe is in a hypostatic condition. The lung weighs 815 grams. The right lung is adherent to the chest wall, but the adhesions are easily broken up. In the upper lobe the apex is one large cavity surrounded by a distinct line of fibrous tissue, the rest of the lobe is œdematous and congested. The middle lobe is very œdematous and contains tubercular nodules. The lower lobe contains tubercular nodules and some small abscesses. The lung weighs 887 grams. The liver weighs 1,440 grams and is normal. The spleen weighs 172 grams and is normal. The right kidney weighs 197 grams; the left kidney weighs 227 grams; both are slightly œdematous and pale in color. The pancreas weighs 57 grams. The mesenteric glands are enlarged and tuberculous. The stomach is very small and presents a shriveled appearance. At the junction of the ileum and the jejunum there is an area 20 cm. long which is congested and which contains tubercles. There are some tubercular ulcerations in the cæcum. There are ulcerations scattered along the entire intestinal tract, especially the lower part of the small intestine. No further examination made.

W. J. L.
T. B. P.
J. M. G.

CASE 24.

W. A. K.; aged 26; nativity, British Guiana; admitted to the United States Marine Hospital, Boston, Mass., April 9, 1898; died October 21, 1898.

History.—On admission patient stated that he had had a cough since the preceding autumn, but that it had increased in severity during the past month: had lost 20 pounds of flesh within the past three weeks, and suffered from night sweats and chilly sensations. Physical examination showed râles at the apex of the left lung; dullness on percussion, increased vocal fremitus and faint respiratory sound over the lower lobe of the right lung. An abundance of tubercle bacilli were found in the sputum. Bowels were persistently constipated, requiring the constant use of laxatives. For two months his cough continued severe, being only

slightly influenced by treatment, and there was no material change in his condition. Until July 4 he had a regular evening rise of temperature ranging from 37.5° to 38.5°, but from this time until August 11 his temperature was normal except slight exacerbations on the 23d and 28th of July. From August 11 til death his evening temperature was 1 or 2 degrees above normal, his morning temperature always falling to normal except on the two days immediately preceding death. August 15 was taken with diarrhea, which persisted irregularly for three weeks; complained of pain over the entire left side of thorax, which was increased by coughing; cough increased steadily in frequency and severity. September 16 was hoarse and complained of sore throat; cough frequent and exhausting, and had great difficulty in raising secretions; would often vomit up his meals during spells of coughing; appetite poor and very capricious. September 19-25 stated that he felt better. September 25 complained of headache, which was promptly relieved by treatment. September 26 obstinate constipation developed. September 30 felt weak and dizzy; voice and pulse very weak; cough constant but inefficient. October 4 weaker; cough distressing, and suffers from insomnia; in the afternoon had a most exhausting coughing spell, with great dyspnoea; insomnia and cough continue, and are with great difficulty relieved by large doses of morphine. Died October 21, 8.45 a. m.

Necropsy (three hours after death).—Circumference at shoulders 86 cm.; slight post-mortem lividity of the dependent portions; rigor mortis very slight; greatly emaciated; pupils dilated. Heart weighed, after opening, 200 grams; pericardial sack contained 100 c. c. of pale straw-colored fluid; all the cardiac valves were competent; left ventricle normal in size and contained a pink clot; right ventricle normal in size; walls flabby; right auriculo-ventricular opening larger than normal, readily admitting four fingers; cardiac muscular tissue cut easily; the normal relation between the right and left ventricular walls maintained. The thoracic and abdominal aorta and the common carotids were atheromatous; abdominal aorta contained dark clots. Larynx and trachea were normal. Left lung weighed 1,080 grams; adhesions dense and general in the left pleural cavity; this cavity also contained air; the left upper lobe was entirely occupied by a single cavity, containing semifluid cheesy material; the rest of the lung was filled with miliary tubercles and smaller cavities. Right lung weighed 1,070 grams; air present in the right pleural cavity and adhesions at the apex of the right lung; cavity the size of a hen's egg in the apex, filled with cheesy material, and similar smaller cavities throughout the rest of the lung except in the lower lobe, where there was a small area of normal lung tissue. Peribronchial glands were much enlarged. Stomach normal in size; hyperæmia of the gastric mucous membrane; cardiac and pyloric orifices normal. Mucous membrane of the lower part of the ileum densely infiltrated; an ulcer, its long diameter transverse to the lumen of the gut, 40 cm. from the ileo-cæcal valve. Large intestine normal. Liver weighed 1,675 grams; cuts normal and presented no macroscopic lesion. Pancreas weighed 125 grams. Left kidney weighed 200 grams; lobulated, pale, and cuts with more than normal resistance. Right kidney weighed 160 grams; also lobulated; macroscopic evidence of contracted kidney. Spleen weighed 140 grams; normal. Brain weighed 1,200 grams; serous fluid in the subdural space.

F. I.

CASE 25.

E. G.; aged 37 years; nativity, Tennessee; admitted to the United States Marine Hospital, Memphis, Tenn., August 17, 1898; died October 20, 1898, at 4.25 p. m.

History.—Recorded diagnosis on entry was "Intermittent fever, malarial;" man was a chronic alcoholic.

Necropsy (four hours after death).—Body that of small, spare, ill-nourished white male; looked to be 45 years. No rigor mortis. Cicatrix on right leg, just

below knee. No discharge from mouth or nose. Mouth open; pupils dilated. Thorax: Pericardium opened; contained about 100 c. c. fluid. Heart weighed 380 grams; valves pale and flabby; some recent vegetations on mitral valve, but all valves were apparently competent. Larynx and trachea dry or very slightly moist. Strong pleuritic adhesions on right side; left pleura free. Right lung infiltrated with tubercle; several cavities. The lung was so bound down by adhesions that it could only be removed in pieces. Weight of right lung, 1,080 grams; left lung, œdematous, weighed 430 grams. Stomach contained many petechiæ and small hemorrhages; its blood vessels much enlarged; mucous membrane covered with viscid, sticky mucons. The small intestine was normal in appearance, but its caliber seemed to be contracted. The appendix was converted into fibrous cord and matted down by old inflammatory adhesions. Liver: Chronic congested or nutmeg liver; pale brown in color and bleeds easily on section; weight, 1,770 grams. Gall bladder contained a small quantity of thick, black bile. Spleen enlarged, soft and pulpy; weight, 210 grams. Left kidney, weight, 80 grams; right kidney, 70 grams. Capsule of both kidneys peeled with difficulty. Line of demarcation between cortical and medullary substances almost entirely eliminated. Kidney substance hard and granular; small granular kidney of Bright. Urinary bladder empty.

As family desired body, the brain and cord were not examined.

W. P. McI.

CASE 26.

B. S.: aged 39 years; native of Missouri; admitted to United States Marine Hospital, Cairo, Ill., suffering from tubercle, and died October 14, 1898.

History.—Family history good. Had cough for about two months with considerable expectoration; little appetite, frequently vomiting his food. No night sweats. Very short of breath—can not walk a square without resting. Has chills, sometimes lasting two hours. Has diarrhea. Has lost 40 pounds of flesh in two months. Six days after admission streaks of blood in sputum; has tickling sensation in throat continually; has night sweats; the disease culminating after six months in his death.

Necropsy (five hours after death).—Rigor mortis slight. Body pale; greatly emaciated. No cicatrices. Lungs and pleura firmly adherent to the chest walls everywhere. Right lung filled with a large number of small cavities; no part of lung free from disease; weight, 1,600 grams. Left lung almost entirely taken up with one large cavity; rest of tissue broken down; weight, 1,850 grams. Heart normal; valves competent; weight, 500 grams. Pericardium partly filled with serum. Liver dark in appearance; weight, 1,800 grams. Gall bladder full of bile. Spleen normal; weight, 125 grams. Omentum and intestines contain many tubercular deposits. Other organs not examined.

W. A. W.

CASE 27.

E. G.: aged 35; nativity, Pennsylvania; was admitted to United States Marine Hospital, Cincinnati, Ohio, October 1, 1898; died December 10, 1898.

History.—The patient gave a history of lung trouble for about a year. Cough, fever, night sweats, and general weakness. Family history negative. Physical examination: Appearance poor; very much emaciated and ænemic. Chest flat on both sides, expansion lessened very much on right side. There was dullness on left side, and tympanitic resonance on right side; bronchial breathing on both sides. Expectoration muco-purulent and very free; temperature 38.6°. Patient never improved any, and gradually grew weaker and died December 10, 1898.

Necropsy (fifteen hours after death).—Rigor mortis slight; body very much emaciated. Brain normal; weight, 1,540 grams. Chest: Pleura on the right side

could not be distinguished. Right lung was broken down, and seemed one large cavity, scarcely any lung tissue being left; weight, 212 grams. Left lung: Pleura adherent to chest wall, and lung upon section was seen to be riddled with small cavities; weight, 530 grams. Heart: Pericardium contained 100 c. c. of fluid; valves of heart normal; weight, 390 grams. Mediastinal glands enlarged. Abdomen: Stomach normal; liver apparently normal; weight, 1,860 grams. Mesenteric glands were enlarged and caseous. Spleen enlarged and congested; weight, 510 grams. Left kidney normal, 160 grams. Right kidney congested: capsule adherent; weight, 190 grams. Pancreas normal; weight, 68 grams. Small intestines congested.

W. A. W.

J. W. S.

CASE 28.

J. H.; aged 37 years; nativity, Ireland; admitted to the United States Marine Hospital, Cleveland, Ohio, December 3, 1898; died January 18, 1899.

History.—Patient entered hospital complaining of weakness, loss of appetite, and a severe cough. He stated that his present trouble started during the summer, when he contracted a severe cold, and that his cough had been continually growing worse, although he had been at work and felt pretty well otherwise, except that he had lost a great deal of flesh (about 40 pounds in three months). At the time of admission his stomach was very irritable, and it was with difficulty that he was able to eat anything. On examination the patient was found to be greatly emaciated; very anæmic; throat much inflamed and ulcerated, pharynx covered with a thick coating of muco-pus. There was a marked sinking in chest walls in the clavicular regions. Respiratory movements diminished on the left side. Diminished resonance all over the chest, most marked in left clavicular region. Auscultation showed moist râles, coarse and fine, all over the chest, but most marked at the apex of right lung. Respiration harsh in character. Tubular breathing heard over the left apex; also bronchophony. Heart somewhat hypertrophied; cardiac impulse just outside of mammary line at sixth rib sounds clear; second sound at aortic area was slightly accentuated. Arteries thickened, especially the radials. Pulse rapid, regular, and of small volume. From the time of admission the patient steadily grew worse, emaciation was rapid and progressive, and toward the end he developed corneal ulcers, the result of inanition, and died January 18, at 3. p. m.

Necropsy (nineteen hours after death).—Rigor mortis marked; general nourishment very poor; pupils dilated; corneal ulceration very marked. Pericardium contained 10 c. c. of serum. Heart weighed 235 grams; poorly nourished; valves all competent. Left pleural cavity contained 1,500 c. c. of serum, and was thickened and adherent. Left lung weighed 590 grams. The apex contained a large cavity, and the whole lung was filled with tubercular deposits. Right pleural cavity contained adhesions in axillary line and at apex of the lung. Right lung weighed 795 grams. The middle and upper lobes were studded throughout with tubercles; the lower lobe was passively congested. The stomach was congested; mucous membrane darker than normal, and covered with a thick, tenacious mucus. The small intestine was congested. The vermiform appendix was bound down by old adhesions; the colon contained some fecal matter. The liver weighed 2,040 grams. The surface presented several old cicatricial contractions. There was increased resistance on section. The left lobe contained a growth about the size of a walnut, and numerous smaller ones were found throughout the liver substance. The gall bladder contained 50 c. c. of dark, ropy bile. The pancreas weighed 90 grams. The left kidney weighed 180 grams; capsule adherent, and cortex somewhat thinned. The right kidney weighed 160 grams, and was in about the same condition as the left. The pelvis of left kidney contained a small calculus about the

size of a grain of wheat; ureters normal. The bladder was slightly congested. The urethra and prostate were normal. The spleen weighed 185 grams; capsules wrinkled; pulp firmer than normal. Brain weighed 1,490 grams; membranes normal.

H. W. W.

CASE 29.

J. G. A.: aged 35 years; nativity, Norway; was admitted to the United States Marine Hospital, San Francisco, Cal., December 21, 1898, and died January 11, 1899, at 12.40 p. m.

History.—Patient had typhoid fever two years ago. Present trouble began in July, 1898, with a cough and fever. Coughing was accompanied by the expectoration of a thick, yellow material. He had lost 20 pounds in weight since the onset of his illness. Sometimes he would sweat at night and occasionally expectorated blood. Slight exertion provoked dyspnoea. The supraclavicular and supra-sternal spaces were sunken. On percussion there was dullness over the apex of the left lung extending downward to the fourth rib, and dullness from the right apex to the fifth rib. In the left lung there was a cavity behind the second rib 1 inch in diameter. On auscultation bronchial breathing was heard over the superior lobes of both lungs. Tubercle bacilli were found in the sputa. Patient gradually grew weaker until January 11, at 12.40 p. m., when he died. The treatment was creosote, gradually increased from 0.1 to 0.33 gram doses; a palliative cough mixture; aromatic sulphuric acid, 0.64 c. c. at intervals when sweats and diarrhea were troublesome, and bichloride of mercury, 0.0006 gram three times daily. Sometimes lead and opium pills were given every two hours to stop diarrhea. Special attention was given to dieting the patient.

Necropsy (three and one-half hours after death).—The body is that of a poorly developed, poorly nourished, white adult male. No distinguishing marks on the body. Rigor mortis is slight. The pupils are dilated. The peritoneum is normal. The pericardium contains 30 c. c. of a clear, straw-colored fluid. The heart weighs 190 grams. The walls of the ventricles are flabby and in a state of fatty degeneration. The valves are normal. The thoracic and abdominal aorta are normal. The visceral pleural surfaces are adherent to the parietal pleurae on both sides. The left lung is 377 grams in weight and is filled with tubercular abscesses. The right lung weighs 897 grams and is infiltrated with miliary tubercles. The left kidney weighs 107 grams and shows amyloid changes. The right kidney weighs 102 grams and also shows amyloid degenerative changes. The spleen is smaller than normal and weighs 147 grams. It has one supernumerary lobule attached to it. The liver is greatly congested and dark colored. Its weight is 1,385 grams. The intestines show numerous ulcerations throughout the ileum. One of these about 2 cm. in diameter has a perforation at its center and about 15 c. c. of pus was found in the recto-vesical space. The dura mater is adherent to the calvarium and is congested. About 20 c. c. of clear fluid escaped from the subdural space. The brain is normal in appearance and weighs 1,470 grams.

L. H. H.

T. B. P.

J. M. G.

CASE 30.

F. N.: aged 39; nativity, Kentucky; admitted to United States Marine Hospital, Baltimore, Md., February 2, 1899; died April 8, 1899.

History.—Family history negative. Has been a healthy man until a year ago, when he contracted a severe cold which has never been relieved. He has fallen off about 30 pounds in weight, and has also lost strength rapidly. Patient was greatly emaciated on admission. Râles were present over every region of the

chest, and voice sounds and fremitus both abnormally increased. Voice was very hoarse, and swallowing solids usually caused pain. Pharynx was inflamed and epiglottis eroded on superior border. Cough was frequent and expectoration free. The patient was placed on milk diet, and also given such solid food as could be readily swallowed. Cod-liver oil and whisky were given freely, and applications of cocaine, and later of iodoform, were made to the epiglottis and larynx. The patient lost flesh and strength rapidly, and during the last days of his life was given morphine hypodermically to relieve the pain in his throat.

Neeropsy (eighteen hours after death).—Body rigid; dependent portions show marked lividity; emaciation extreme. Brain removed; weight, 1,430 grams. Sinuses of dura contain dark fluid blood. Cortex, substance of brain, and nuclei all normal. Lateral ventricles contain about 5 c. c. of yellow fluid. Abdominal viscera normal in situation and appearance. Numerous enlarged mesenteric glands seen. Thorax opened; pericardium contains about 10 c. c. of yellow serum. Heart: Weight, 325 grams; cavities and vessels normal in appearance, and contain white thrombi and dark fluid blood. Right lung: Weight, 960 grams; adherent firmly to pleura, and infiltrated throughout with tubercles, but contains no cavity. Left lung: Weight, 820 grams; upper lobe shows gray hepatization, with a cavity 2 by 2 cm. in the apex. The visceral and parietal layers of the pleura are bound together by dense, strong adhesions, making removal difficult. Bronchial glands are numerous and much enlarged. On the right anterior aspect of the fifth dorsal vertebra is a small globular abscess filled with about 2 c. c. of caseous deposit. The epiglottis is thickly pitted on its posterior surface by small ulcers, and its upper margin is destroyed. Vocal cords swollen and much congested. The arytenoid cartilages also congested, small nodules being seen on the surface of both. Abdominal viscera removed. Stomach and intestines apparently normal. Liver: Weight, 1,650 grams; normal. Pancreas: Weight, 85 grams; normal. Spleen: Weight, 200 grams; normal. Kidneys: Right—Weight, 156 grams; normal. Left—Weight, 160 grams; normal. Bladder: Normal in appearance and contained small amount of ammoniacal urine.

S. R. T.

G. P.

CASE 31.

C. A., aged 27 years; nativity, Norway; admitted to the United States Marine Hospital, Boston, Mass., September 19, 1898; discharged at his own request, November 5, 1898, as improved, but not seaworthy; readmitted November 28, 1898; died February 19, 1899, at 4.30 a. m.

History.—Family history good. Occupation, engineer on vessel. Used tobacco and alcohol in moderation. Had multiple chancres five years ago and subsequently erythematous eruptions and alopecia. Was healthy until 20 years of age. Then had rheumatism for six months, but never since. Had malaria five years ago, and had had it repeatedly since. Had been sick for past two years. Had been sick in this hospital for a week sixteen months ago with heavy cough and cold and had had cough ever since. During that time had had night sweats and hectic fever, but never hæmoptysis. Had lost 15 pounds in last month. On admission, patient was much emaciated; had frequent cough, with expectoration of greenish-colored sputum; frequent micturition; temperature, 38.6° C.; pulse, 110 beats per minute. On physical examination, clavicles appeared very prominent; right side of chest concave and sunken; left side convex and bulging; depression at lower end of sternum; dullness on percussion and increased vocal fremitus over upper lobe of right lung; heightened resonance and respiratory murmur over apex of right lung; and tympany, pectoriloquy, and jerky respiration over upper half of same. Examination of sputum showed bacillus of tuberculosis in large numbers. Temperature ranged between 36° and 39° C., with regular evening

exacerbation. On readmission to hospital on November 28, 1898, patient complained chiefly of shortness of breath and exhibited laryngeal symptoms, pain in lungs, hoarseness, and difficulty of articulation. The disease progressed steadily to a fatal termination, the patient dying at 4.30 a. m. February 19, 1899.

Necropsy (ten hours after death).—Body greatly emaciated; rigor mortis slight; post-mortem lividity present; pupils equally dilated; pericardial sac contained 150 c. c. of straw-colored fluid; valves of heart all normal and competent; left ventricle filled with a black clot; weight of heart after opening, 350 grams; right and left pleuræ both showed evidences of inflammation, the pulmonary and costal layers being adherent. The right lung exhibited a large cavity, involving nearly the whole of the upper lobe, also smaller cavities throughout; its weight was 1,170 grams. The upper lobe of the left lung showed one cavity the size of a walnut, and numerous smaller cavities in the apex: the lower lobe was filled with miliary tubercles and emphysematous patches; weight of left lung, 1,180 grams. Position of abdominal contents normal; mesenteric glands yellow and much enlarged; weight of liver, 1,830 grams; weight of pancreas, 130 grams; weight of kidneys, left, 230 grams; right, 220 grams; weight of spleen, 270 grams. Membranes of brain were slightly œdematous; brain presented tubercular infiltrations along the longitudinal fissures: weight of brain, 1,300 grams.

F. I.

CASE 32.

P. J. (colored), aged 29 years; nativity, Indiana; admitted to the United States Marine Hospital, Evansville, Ind., February 9, 1898; died March 21, 1899.

History.—On admission he complained of pain in his chest, cough, night sweats, and a loss of weight. Examination of lungs showed the presence of tubercular deposit, more pronounced in the left lung. Later an obstinate diarrhea developed that was hard to control. His bowels would move five or six times in the twenty-four hours. The cough became loose and he expectorated freely. The tubercle attacked the larynx, and his voice became husky, and later he could hardly whisper. Deglutition also became painful toward the last. He failed rapidly during the winter months, and died at 11 a. m. March 21, 1899.

Necropsy (twenty-three hours after death).—Rigor mortis was well marked. General nutrition was very poor. Brain and meninges normal; brain weighed 1,252 grams. Heart, normal; weight, 308 grams. Larynx: Internal surface was ulcerated over most of the surface; mucous membrane thickened; epiglottis thickened and ulcerated. The true vocal cords had been entirely destroyed, and the false vocal cords were thickened. The right lung weighed 1,395 grams; greater part consolidated with tubercular deposit, and a cavity in lower lobe of about 20 c. c. capacity. Pleuritic adhesions over the whole surface of the lung held it tightly to the chest wall. The left lung weighed 1,060 grams. The upper lobe was occupied by a large cavity of about 300 c. c. capacity. Its outlet into the bronchus was plainly seen. Two other cavities were found in the lower lobe, each of about 15 c. c. capacity. The rest of the lung was consolidated with tubercular deposit. Pleuritic adhesions all over the lung surface held it tightly to the chest wall. The mediastinal glands were involved in the tubercular process. Liver, normal; weight, 1,940 grams; spleen, 320 grams; left kidney, 230 grams; right kidney, 210 grams; pancreas, 105 grams. Intestines showed numerous tubercular ulcers, more numerous in the large intestine from the splenic flexure down, and the mesenteric glands were involved. Other organs and tissues normal.

J. H. O.

CASE 33.

K. C. (colored), aged 42; nativity, Tennessee; admitted to the United States Marine Hospital, Evansville, Ind., October 8, 1898; readmitted February 7, 1899; died April 8, 1899.

History.—On admission he complained of cough, with blood-streaked expectoration. On examination numerous râles were heard over all the chest surface. Later dullness on percussion was detected over apices of both lungs, more pronounced on the left. Expectoration became more profuse. He had one hemorrhage from the lungs. He failed rapidly during the winter and died at 2.30 p. m. April 8, 1899.

Necropsy (twenty-three hours after death).—Nutrition poor; rigor mortis marked; pupils dilated; brain and meninges normal; brain weighed 1,388 grams; heart weighed 292 grams; normal. About 60 c. c. of fluid was found in the pericardium. Right lung weighed 1,075 grams. Upper lobe only involved in the tubercular process. Rest of lung congested. Cavity of about 15 c. c. capacity found in upper lobe. Left lung weighed 1,190 grams; adherent to chest wall all around. The lung was one mass of tubercular deposits, with innumerable cavities, varying in size, scattered through it. Two cavities were filled with clotted blood. Liver weighed 1,890 grams; normal. Spleen, normal; weight, 355 grams; pancreas, 107 grams; right kidney, 200 grams; left kidney small but normal in shape and appearance; weight, 62 grams. There was no indication of kidney trouble during life. Larynx, intestines, and other organs and tissues normal.

J. H. O.

CASE 34.

F. C., aged 46 years: nativity, Germany: was admitted to United States Marine Hospital, San Francisco, Cal., January 4, and died January 7, 1899.

History.—Patient's family history was negative. He had a chancre sixteen years ago and gonorrhea ten years ago. His present illness began about four years ago, at which time he contracted a cold. Since then he would feel well at intervals, but would relapse into some sort of illness each time. He was in this hospital three years ago for same trouble. Patient complained of cough, with which he raised a thick, yellow, sticky matter, and which was worse in the morning. He had lost much in weight and was unable to walk from weakness. He was dyspnoic on very slight exertion and complained of being cold nearly all the time. He was fairly well developed but much emaciated, and the supraclavicular spaces were much sunken. Left lung gave flat note on percussion from apex to fifth rib in front and to fifth dorsal spine behind. Right lung was flat from apex to third rib. A cavity could be detected between the third and fourth costal cartilages on the right side. Bronchial breathing was heard over superior lobe of right and over almost the entire surface of the left lung. The patient was very much exhausted and gradually grew worse until January 7, when he died at 4 p. m. Treatment consisted of a quieting cough mixture and the administration of whisky as a stimulant with milk, eggs, and beef broths.

Necropsy (twenty-one hours after death).—The body is that of a fairly well-developed, much emaciated, white adult male of medium size. Rigor mortis present. The peritoneum is slightly injected and the omentum is adherent to it. There is a general tubercular peritonitis—the entire intestinal tract being studded with miliary tubercles and the mesenteric glands are generally enlarged. The pericardium is adherent to both pleuræ. It contains 10 c. c. of clear fluid, suspended in which are some flakes of fibrin. The heart weighs 205 grams. It is quite soft and the muscle tears easily. There is a white patch on left ventricle. The valves are all competent. Left and right ventricles each contain a small amount of fluid blood. The right and left auricles contain clotted blood and each has a fibrin clot. Both lungs are adherent to chest wall. Left weighs 1,080 grams and the right 960 grams. Both are found to be generally infiltrated with tubercular masses, and both contain cavities in their superior lobes. The liver weighs 1,340 grams. Its capsule is thickened and its cut surface is pale. The pancreas weighs 50 grams. The left kidney weighs 185 and the right 170 grams. Both are

normal. The spleen weighs 165 grams and is normal. The brain weighs 1,320 grams. Its membranes are a little injected, but the brain proper is normal.

T. B. P.

CASE 35.

C. O., aged, 44 years; nativity, Switzerland: was admitted to United States Marine Hospital, Chicago, Ill., September 9, 1898: died March 15, 1899.

History.—Had been troubled with cough six months previously and had "coughed up" blood three times. Was greatly emaciated. Treatment supporting. Patient failed gradually until two weeks before death, when a high and irregular temperature developed, and patient failed very rapidly.

Necropsy (six hours after death).—Post-mortem rigidity slight. Post-mortem discoloration and post-mortem staining slight. Brain weighed 1,410 grams. Brain and its membranes were apparently normal. Anterior mediastinum, heart, and pericardium were apparently normal. Heart weighed 290 grams. Lungs: Right weighed 800 grams; left weighed 750 grams. One large cavity found in apex of right lung and several smaller cavities in lower lobes. One small cavity in apex of left lung. Tubercles were disseminated throughout both lungs and pleura extensively adherent over both lungs. Great vessels, nerve trunk, and diaphragm apparently normal. Spleen normal; weight, 190 grams. Kidneys: Right weighed 150 grams; left, 165 grams; both apparently normal. Liver weighed 1,670 grams and was apparently normal. Omentum, suprarenal capsules, urinary bladder, organs of generation, rectum, duodenum, stomach, gall ducts, pancreas, solar plexus, mesentery, small and large intestines all were apparently normal.

D. E. R.

CASE 36.

C. M. C., aged 25 years; nativity, Sweden; was admitted to the United States Marine Hospital, San Francisco, Cal., September 3, remaining a month; readmitted November 12, 1898, and died March 14, 1899.

History.—Patient complained of cough, which was worse at night, and with which he raised a thick yellow sputum. He had been growing thinner and weaker for a long time. He had been ill for the past four months. Complained of night sweats. On physical examination found a poorly nourished and much emaciated individual. Respiration was equal on both sides, but was somewhat limited. Vocal fremitus was slightly greater on the right side. There was defective resonance over both lungs, but the pitch was a little higher at the right apex than elsewhere. At the apex of the left lung in front was a loud blowing sound on inspiration. Behind, the blowing sound could be heard over the entire lung area. The voice sounds were louder over the right lung, but were exaggerated over the left lung also. Patient did not improve, but gradually grew worse until his death. Treatment consisted in stimulation with whisky, which was given three times a day, and administration of creosote and cod-liver oil and abundant diet. For the night sweats he received 0.001 gram of atropine daily at 8 p. m. This patient gave evidence of having been an habitual user of morphine hypodermatically.

Necropsy (ten hours after death).—Body that of a much emaciated, adult, white male. The thighs, arms, and forearms are the seats of numerous scars, seemingly former punctures of fine needles—probably hypodermic needles. The peritoneum is normal. The intestines are slightly distended, as is the bladder. Peritoneal cavity contains no fluid. The pericardium is smooth and shining and contains 15 c. c. of clear fluid. The heart shows evidence of fatty degeneration which is more marked on the right side. Its substance is soft and flabby and its cut surface has an oily feeling. The coronary veins are full of blood. The right auricle is filled with a large, mixed clot. The right ventricle contains a small amount of dark fluid blood. The left auricle is filled with mixed clot. The left ventricle is empty.

The heart weighs 260 grams. All its valves are normal. The lungs are both adherent over their entire surfaces to the chest wall and diaphragm and are separated with much difficulty; the left lung weighs 1,160 grams and the right 960 grams. Both are infiltrated with tubercle throughout their whole extent. In both the apices are large cavities. In the inferior lobe of the left lung is a cavity as large as a small orange. The liver weighs 1,830 grams and is normal. The gall bladder contains seven gall stones of varying size. The spleen weighs 190 grams and is normal in appearance. The right kidney weighs 220 grams and the left one 180 grams. The cortices are slightly thickened and are somewhat pale, especially near the pyramids. The intestines are normal, but the mesenteric glands are somewhat enlarged, but not caseous. The brain weighs 1,400 grams and is normal.

H. A. S.

T. B. P.

J. M. G.

CASE 37.

W. Y., aged 38 years; nativity, Kentucky; was admitted into United States Marine Hospital, Cincinnati, Ohio, January 10, 1899, and died March 6, 1899.

History.—Patient had been sick about six weeks, during which time had suffered from cough, pain in chest, dyspnoea, weakness, and night sweats. Family history negative. Physical examination: Body emaciated, with depressions in supra and infra clavicular fossae, chest expansion lessened on both sides, but more on the right. There was dullness on percussion on both sides of chest with tympanitic resonance on right side at third intercostal space. Auscultation showed bronchial breathing over both apices, with amphoric respiration on the right side. Vocal fremitus increased on both sides. Patient complained of pain in left side of chest during entire sickness and had moderate diarrhea. The disease made rapid progress and patient gradually grew weaker and died March 6, 1899.

Necropsy (twenty-four hours after death).—Body very much emaciated, rigor mortis present. Membranes and brain normal, weight, 1,450 grams. Chest: Left lung and pleura, left side, firmly adherent to chest wall. The left lung was studded with tubercle and contained several small caseous masses, weight, 780 grams. Right lung and pleura slightly adherent posteriorly to chest wall. The lung was broken down and contained one large cavity, weight, 420 grams. Heart: Pericardium normal, contained no fluid. Heart was slightly flabby, valves normal, weight, 330 grams. Abdomen: Liver slightly congested, weight, 1,470 grams. Spleen normal, weight, 90 grams. Both kidneys were slightly contracted, right, weight, 120 grams; left, weight, 90 grams. Mesenteric glands were very much enlarged. There was marked congestion of the small intestines throughout.

J. W. S.

CASE 38.

J. E.; aged 57 years; nativity, New York; admitted to the United States Marine Hospital, Cleveland, Ohio, May 23, 1898; died March 17, 1899.

History.—The patient when admitted complained of cough, pain in the chest, and anorexia. He stated that his parents died of old age. He had typhoid fever years ago and pleurisy twelve years ago. About a year and a half ago patient had a hemorrhage from his lungs and has been troubled with cough since that time. Examination of the chest showed wheezing râles and general dullness on percussion. There was a marked accentuation of the second sound of the heart at aortic area; no valvular lesions were detected. There was marked sclerosis of the radial, brachial, and temporal arteries. During the period the patient was under treatment he was greatly troubled with constipation. His condition was apparently unchanged for some months after entering the hospital, so slow was the process, but he finally became more and more exhausted, and died March 17 at 7.30 a. m.

Necropsy (seven hours after death).—Lividity marked, rigor mortis not present, general nourishment poor, pupils dilated. The pericardial sac contained 100 c. c. of serum. The heart weighed 210 grams and was poorly nourished. The valves were all competent. The coronary, radial, brachial, and temporal arteries presented marked sclerotic changes. The left pleural cavity contained adhesions posteriorly. The left lung weighed 750 grams and was studded with tubercular deposits throughout. The process was most marked at the apex. The right pleural cavity was a mass of old adhesions. The right lung weighed 1,045 grams: the upper lobe was the seat of two large cavities: there was also a cavity in the middle lobe, while the lower lobe was a mass of tuberculous nodules. The peritoneum was normal. The stomach was distended with gas: the mucus membrane was pale, with some small areas of congestion; the pylorus was somewhat constricted and thickened; the intestines were normal. The liver weighed 1,080 grams, was dark brown in color, and offered increased resistance on section. The gall bladder contained 10 c. c. of bile; duct normal. The pancreas weighed 92 grams. The left kidney weighed 190 grams, capsule adherent; cortex slightly thinned. The right kidney weighed 140 grams and presented about the same condition as the left, except that there was a small urinary cyst on the under surface of the capsule. The bladder and urethra were normal. The spleen weighed 155 grams. The dura mater was the site of several small tubercular deposits at the junction of the longitudinal fissure with fissure of Rolando. The brain weighed 1,200 grams.

H. W. W.

CASE 39.

A. S.: aged 42 years; nativity, Finland; was admitted to the United States Marine Hospital, port of San Francisco, Cal., October 14, and died October 21, 1898.

History.—Patient entered hospital in a very exhausted condition. He was much emaciated, coughing constantly, and almost in a state of collapse. He was immediately given a hypodermic of strychnine and placed in bed. The patient said he had been feeling badly for the last four or five years, but until five months ago he has been able to attend to his regular duties. For the last five months he has been able to do light work until two weeks ago, when he was compelled to cease work altogether. During all this time he has constantly been failing in health, and has gradually been growing more and more emaciated. He gives a history of cough which is much worse in the morning than at other times. He expectorates a thick, viscid, yellow material of foul odor. At times great quantities of this are discharged. He has night sweats and has been constantly growing weaker. For the last three weeks the patient has been troubled with vomiting after eating. His respiration was very rapid, being 44 to the minute. His pulse was 120 to the minute. He complains of not being able to sleep at night. On examination find a well-developed but very poorly nourished individual. Both supra-clavicular spaces are sunken, and the infra-clavicular space on the left side is also somewhat sunken. On percussion there was dullness over the apices of both lungs and extending downward on the left side as low as the fourth rib and on the right side as low as the third rib. On the back a dull area could be obtained over both apices. On auscultation bronchial breathing could be heard over these dull areas, and below them, at various points over the entire lung surfaces of both sides, could be heard loud bubbling râles. The sputum examination by the microscope revealed large numbers of the bacillus tuberculosis, confirming diagnosis of pulmonary tuberculosis. The patient was given a warm bath and placed in bed, and a calomel and soda powder given. The treatment was palliative and sedative, the patient receiving three times a day two drops of creosote in 200 c.c. of milk and a sedative mixture to allay the incessant cough. As a stimulant and food he received a mixture

of cod-liver oil, malt, and whisky. When admitted his temperature was 39.2° C., but in forty-eight hours had fallen to normal and thereafter did not rise above that point. Treatment was continued until October 21, on which day patient died at 5.30 p. m.

Necropsy (eighteen hours after death).—The body is that of a fairly well-developed, poorly nourished, middle-aged white male. Rigor mortis is present. The peritoneum is smooth, and to all external appearances normal. The intestines are slightly congested. The pericardium is smooth, and the pericardial sac contains 20 c. c. of a straw-colored fluid. The heart surface was normal in appearance and consistence. Its weight was 497 grams. The ventricles and auricles were both filled with semiclotting blood. The valves of the heart are all found in a normal condition. The aorta and pulmonary arteries contain post-mortem clots, as do also the pulmonary veins. The left lung weighs 1,337 grams. The pleura is adherent to the chest wall, and the pleural cavity is empty. The upper lobe is consolidated, presenting a hard, nodular feeling, and contains a few small abscess cavities. The lower lobe is infiltrated with pus and contains some few cavities. The entire lung was found on section to be studded with tubercular masses. The right lung weighs 1,310 grams. The pleura is adherent to the chest wall, and the pleural cavity contains no fluid. The entire lung is infiltrated with pus and on section presents tubercular nodules and a few small cavities throughout its entire extent. The upper lobe is hard and nodulated and very firmly attached to the apex of the pleural cavity. The bronchial tubes are filled with pus. The bronchial glands are enlarged. The liver weighs 2,500 grams; it is somewhat softened and congested. The gall bladder is distended, but normal in appearance. The pancreas weighs 60 grams and is normal. The spleen is 165 grams in weight and is normal. The kidneys are found united, forming a horseshoe kidney; its weight is 290 grams; it is normal on section. The bladder is empty and normal. No further examination was made.

H. A. S.

T. B. P.

J. M. G.

CASE 40.

W. H.; aged 36 years; nativity, Michigan; transferred to United States Marine Hospital, Detroit, Mich., from Saginaw, Mich., September 10, 1898; died June 7, 1899, at 10.50 a. m.

History.—Patient gave history of gonorrhea some two years previous to being admitted to hospital. Was in the hospital during winter and spring of 1896 and 1897; also here about one week during winter of 1897 and 1898. Previous to September 10, 1898, was in Saginaw hospital for twenty-five days, during which time he was confined to bed for twenty-one days and had severe hemorrhages. On admission patient was poorly nourished, complained of shortness of breath, coughed a great deal, had night sweats and pain over right side of chest. On physical examination the chest appeared flattened and the respiratory excursion limited, especially on the right side. A red papular eruption covered the abdomen. Palpation demonstrated increased fremitus on right side posteriorly. Percussion note flat and short in character, rather hyperresonant than dull. Some dullness below clavicle. Auscultation: Friction sounds over right side anteriorly, also some sibilant râles. Posteriorly there were many râles, especially over apex. Loss of vesicular murmur on left side posteriorly. Treatment was of no avail, and gradually the patient grew worse, till death occurred June 7, 1899.

Necropsy (twenty-four hours after death).—Body very much emaciated, no external marks. Rigor mortis marked. Naked-eye appearance of meninges and brain normal, excepting a slight congestion. The pericardial sac normal and contained about 25 c. c. of pericardial fluid. The heart valves were found in good condition;

weight of heart after opening, 230 grams. Left lung weighed 620 grams: was adherent to the thoracic walls, congested, oedematous, studded with tubercles, and at apex several small cavities were found. Right lung weighed 850 grams. Several small cavities were found in the apex, and a large cavity in the lower portion of the middle lobe, near the periphery, from which hemorrhage had occurred. The pleural cavity found obliterated by adhesions. Liver weighed 1,500 grams; light in color, enlarged, firm and hyperæmic. Gall bladder smaller than normal, containing normal amount of bile. Pancreas normal; weighed 90 grams. Kidneys on examination were found normal with the exception of a marked thinning of the cortical substance. Right kidney weighed 200 grams, left kidney 220 grams. Spleen normal; weighed 160 grams. Intestines normal excepting contracted condition of ascending and transverse colon. Other organs normal in appearance.

J. G.

CASE 41.

A. D. (colored), aged 19 years, Tennessee: admitted to United States Marine Hospital at St. Louis, Mo., on October 29, and died December 23, 1898, at 4 a. m.

History.—After three months' suffering with a bad cold, which grew steadily worse, the patient presented himself on the 29th day of October, 1898, for treatment at this hospital, and at that time had the following symptoms: Pain in chest, dyspnoea, cough, expectoration of muco-purulent phlegm: in afternoon and evening a fever, accompanied by frontal headache; appetite good; steadily losing flesh; no night sweats. During a coughing paroxysm a week before admission he expectorated some blood. Family history negative; has had syphilis. Physical examination: Consolidation of upper part of both lungs; moist crackling rales on inspiration on both sides, breathing shallow, fast, and rough; heart not enlarged and no murmurs heard over cardiac region. Tubercle bacilli were found in the sputum. The patient did fairly well until the middle of November, when he began to fail rapidly. He became so emaciated he had great difficulty in resting comfortably on any part of his body, and an air mattress was provided for him. He finally died from exhaustion, at 4 o'clock a. m., on the morning of the 23d of December.

Necropsy (thirty-five hours after death).—External appearance revealed extreme emaciation about extremities, but not so much so in reference to the trunk. Height, 168 cm.; body light mahogany color. Rigor mortis moderate in lower extremities, not so well marked in arms; glans penis of a brown color, a pale pink spot 3 mm. in diameter on its under surface. Internal: A thin layer of yellowish fat shown on making the usual incision for exposing thoracic and abdominal viscera; very little odor on opening abdomen or thorax; position of diaphragm normal. Thorax: The right lung adherent for a space slightly greater than a silver dollar to the chest wall on right side, and attached more or less throughout at upper lobe; right lung adheres to pericardium and posterior mediastinum. Right lung: Base of right lung not adherent; root of lung infiltrated with minute masses of tubercle and enlargement of adjacent bronchial glands; right lung 21 cm. from apex to base, 17 cm. from before backward, 9 cm. thick, weight 930 grams; the lobes are adherent but can be separated with care; upper lobe consolidated, and more or less the rest of the lung substance the seat of tubercular infiltration; a cavity about the size of a walnut filled with pus occupies central part of upper lobe, and another even more purulent, surrounded by cicatricial tissue, in external and upper part of middle lobe. Left lung so adherent that it would be impossible to describe the broken segments which would result were an attempt made to extricate it. Heart enlarged, flabby, and pale; measured 12 cm. from apex to base, 10 cm. from side to side, 5 cm. through; weight 315 grams; right ventricle filled with clotted blood; valves normal; tubercles in pleura covering diaphragm. Abdomen: No foreign bodies; position of viscera normal; great omentum of yellow

appearance. Stomach adherent to duodenum and tubercles in adherent peritoneum; mesentery tubercular. Spleen enlarged, measurements 13 by 9 by 5 cm., weight 210 grams. Right kidney normal, measurements 12 by 6 by 4 cm., weight 150 grams. Left kidney normal, measurements 12 by 7 by 4 cm., weight 153 grams. Stomach normal. Liver purple and shows evidences of a passive congestion, measures from side to side 21 cm., from above downward in greatest thickness 8 cm., and before backward 19 cm.; weight 1,400 grams; white circles around interlobular veins. Gall bladder contained 25 c. c. of bile. Brain not examined.

H. S. F.

W. G. S.

CASE 42.

M. H., aged 62 years; nativity, Ireland; admitted to United States Marine Hospital at St. Louis, Mo., on August 18, 1897, and died January 9, 1899, at 5.30 o'clock p. m.

History.—The patient complained of pain in his back and a bad cold. He had sprained his back two months before while lifting a barrel. He had had the cold for six weeks. His cough was very bad at night and he expectorated a large quantity of yellowish gray matter. Normal weight 149 pounds; present weight 129 pounds. Physical examination: Body anæmic and emaciated, upper portion of sternum prominent, lower portion depressed, marked dullness on percussion over whole of right side of chest, except a small space in front, over which an amphoric sound is obtained; respiratory sounds roughened over both lungs. Temperature normal, respirations 28, pulse 88. On August 21 the patient had a chill with rise of temperature to 39° and pain in right side. On August 28 the tubercle bacillus was found in the sputum. On September 1 he weighed 119 pounds. He was very restless at night and occasionally had night sweats. Through his whole illness he suffered from insomnia and would sleep only a few hours at a time. He was given creosote in increasing doses until 50 drops were taken three times a day. He gradually improved under this treatment, and on November 30, 1897, he weighed 131 pounds. On examination of the sputum on this day it showed the tubercle bacilli present in great number. December 8 an examination of his urine was made. Amount passed in twenty-four hours 1,250 c. c. Reaction acid, sp. gr. 1.020; no albumen or sugar present: the microscope revealed nothing abnormal. On May 2, 1898, a physical examination was made and the same condition of the lungs was found to be present as on the first examination. Dullness over the apex of the right lung was especially marked: respiratory sounds harsh, expiration sounding louder than inspiration. Examinations of the sputum were made by myself and other officers during the summer and autumn of 1898, but none of us succeeded in finding the tubercle bacillus. During this time he expectorated large quantities of matter, two or three cupfuls during a night. The expectorated matter was thick, viscid, of a grayish white color, and occasionally of an offensive odor. The only time of his illness he had fever was in August and September, 1897. On December 29, 1898, he had severe pain over the base of right lung. Only slight dullness was present over this region on percussion, but numerous rales were heard on auscultation. The right side of the chest was strapped with adhesive plaster and the pain subsided. A few days after this his sputum became very offensive, his legs swelled, and he grew so weak he could not move without assistance. He lingered until January 9, 1899, dying at 5.30 in the afternoon.

Necropsy (twenty hours after death).—Body very much emaciated, legs swollen, abdomen depressed, height 165 cm., tattoo marks on left forearm, rigor mortis not well marked, only a small quantity of fat in abdominal walls, thickness of abdominal wall $1\frac{1}{2}$ cm., mesentery contains some fat, intestines of a light gray color. On opening thorax an offensive odor is perceived; right pleural cavity

filled with purulent fluid, pleural membrane very much thickened, lined with pyogenic membrane; only a small portion of the right lung remains and this is in the upper part of the chest and is in a decomposed condition. Considerable fat on outside of pericardial sac; sac contains normal quantity of fluid. Heart: Weight 480 grams, 10 by 10 by 5 cm., thickness of wall of right ventricle 1 cm., left ventricle 2½ cm., valves of heart normal. Right lung of a dark slate color, crepitant, and on section of a grayish color, apex softened and tissue beginning to break down, rest of lung oedematous. Spleen: Weight 280 grams, 12.7 by 9 by 4 cm., tissue soft and easily crushed, of a brick-dirt color. Left kidney: Weight 180 grams, 11 by 7 by 3.5 cm., pelvis filled with fat, thickness of cortical layer 3 mm., pyramids small and of a light red color. Right kidney: Weight 170 grams, 13 by 5½ by 3 cm., thickness of cortical layer 5 mm., appearance of tissue the same as in other kidney. Stomach, 24 by 9 cm., mucous membrane of a grayish slate color. Intestines filled with yellowish fluid, no ulcers present. Liver: Weight 1,620 grams, 25 by 18½ by 8 cm., tissue on section shows red spots surrounded by white circles, considerable blood exudes. The brain and its membranes were not examined.

W. G. S.

CASE 43.

A. D. (colored), aged 19 years; nativity, Tennessee; admitted to United States Marine Hospital at St. Louis, Mo., on October 29, and died December 23, 1898, at 4 a. m.

History.—After three months' suffering with a bad cold, which grew steadily worse, the patient presented himself on the 29th day of October, 1898, for treatment at this hospital, and at that time had the following symptoms: Pain in chest; dyspnoea; cough; expectoration of muco-purulent phlegm; in afternoon and evening a fever, accompanied by frontal headache; appetite good; steadily losing flesh; no night sweats. During a coughing paroxysm a week before admission he expectorated some blood. Family history, negative. Has had syphilis. Physical examination: Consolidation of upper part of both lungs; moist crackling râles on inspiration on both sides; breathing shallow, fast, and rough; heart not enlarged and no murmurs heard over cardiac region. Tubercle bacilli were found in the sputum. The patient did fairly well until the middle of November, when he began to fail rapidly. He became so emaciated he had great difficulty in resting comfortably on any part of his body, and an air mattress was provided for him. He finally died from exhaustion at 4 a. m. on the morning of the 23rd of December.

Necropsy (thirty-five hours after death).—External appearance revealed extreme emaciation about extremities, but not so much so in reference to the trunk. Height, 168 cm.; body, light mahogany color. Rigor mortis moderate in lower extremities; not so well marked in arms. Internal appearance: A thin layer of yellowish fat shown on making the usual incision for exposing thoracic and abdominal viscera; very little odor on opening abdomen or thorax; position of diaphragm normal. Thorax: The right lung is adherent for a space slightly greater than a silver dollar to the chest wall on right side, and attached more or less throughout at upper lobe. Right lung adheres to pericardium and posterior mediastinum. Right lung: Base of right lung not adherent; root of lung infiltrated with minute masses of tubercle and enlargement of adjacent bronchial glands. Right lung 21 cm. from apex to base; 17 cm. from before backward; 9 cm. thick; weight, 930 grams. The lobes are adherent, but can be separated with care; upper lobe consolidated and more or less the rest of the lung substance the seat of tubercular infiltration; a cavity about the size of a walnut filled with pus occupies central part of upper lobe, and another even more purulent, surrounded by cicatricial tissue, in external and upper part of middle lobe. Left lung: So adherent that it would be impossible to describe the broken segments which would result were an attempt made to extricate it. Heart: Enlarged, flabby, and pale; measured 12 cm. from

apex to base; 10 cm. from side to side; 5 cm. through; weight, 315 grams. Right ventricle filled with clotted blood; valves normal; tubercles in pleura covering diaphragm. Abdomen: No foreign bodies; position of viscera normal. Great omentum of a yellow appearance. Stomach adherent to duodenum and tubercles in adherent peritoneum; mesentery tubercular. Spleen enlarged; measurements, 13 by 9 by 5 cm.; weight, 210 grams. Right kidney normal; measurements, 12 by 6 by 4 cm.; weight, 150 grams. Left kidney normal; measurements, 12 by 7 by 4 cm.; weight, 153 grams. Stomach normal. Liver purple, and shows evidences of a passive congestion; measures from side to side, 21 cm.; from above downward, in greatest thickness, 8 cm.; and before backward, 19 cm.; weight, 1,400 grams; white circles around interlobular veins. Gall bladder contained 25 c. c. of bile.

H. S. F.

W. G. S.

CASE 44.

J. A., aged 34; nativity, Finland; was admitted to St. Mary's Infirmary, port of Galveston, Tex., September 24, 1898; died January 17, 1899.

History.—On admission he complained of cough which had lasted six weeks, occasional chills and fever, and of spitting blood and pus in considerable quantities. Temperature slightly above normal. Patient's appetite was very poor. He was very weak, but bright and cheerful and able to be around. One week before death he had a slight hemorrhage, but the blood disappeared from the sputum in a few days. On the evening of January 17 he went out to the gallery to take a walk and fell down apparently in syncope; he was dead when picked up a few moments later. Physical examination showed abundant coarse râles over upper lobes of both lungs. The case was diagnosed as one of tubercular phthisis.

Necropsy (forty hours after death).—External examination: Body of well-developed man, decidedly emaciated. Height, 5 feet 6 inches; circumference around nipples, 30 inches; circumference of abdomen at umbilicus, 26 inches. Superficial scars on each knee; smallpox pitting on face; scar of old wound on left cheek. Slight hypospadias. Post-mortem lividity marked, rigidly passing off. Internal examination: The cranial cavity was not examined. The thorax and abdomen being opened there was found marked enteroptosis, the transverse colon dipping into the left iliac fossa. The hepatic and splenic flexures were in normal positions, the stomach was only slightly dilated and not prolapsed, and the small intestines were normal. The vermiform appendix hung free into the pelvis, and presented a small abscess in its wall about the size of a small pea; there were no adhesions. Heart: The pericardium contained about 60 c. c. clear fluid. The right ventricle was moderately distended with partially decolorized blood clot; left ventricle fully distended with black clot. Right auricle distended with black clot; left auricle nearly empty. The aortic and pulmonary valves were competent as tested by water test; no valvular lesion; heart muscle appeared normal. Lungs: The left lung was bound by strong adhesions to the chest wall and diaphragm. In the apex, and occupying the greater part of the upper lobe, were two large cavities communicating with each other. They were traversed by several blood vessels, and contained a considerable quantity of blood-stained pus. The lower lobe was entirely occupied, except for a narrow area on its surface, by typical miliary tubercles, the tubercles being more densely packed near the root of the lung. They formed a tree-like picture on section as they followed the distribution of the bronchioles. None of these had reached the stage of abscess formation as seen by the naked eye. The right lung was in an exactly similar condition, except that there were multiple cavities in the apex and the lower lobe was not quite so densely infiltrated as on the left side. The abdominal organs were all carefully examined and all appeared fairly normal, except for the point

noted above. There were no tubercles in the intestines. As there was no room for doubt as to the character of the pathological findings, no microscopical examination was made.

W. K.

CASE 45.

A. E. H., aged 36 years; nativity, Massachusetts; admitted to the United States Marine Hospital, Boston, Mass., May 4, 1888; died August 13, 1898.

History.—On admission to the hospital the patient stated that he had been sick six months with a cough; had lost much flesh; had night sweats, and frequent nausea and vomiting. Physical examination revealed moist râles at apex of right lung with dullness on percussion; roughened respiration at apex of left lung, and moist râles diffused over both sides of chest posteriorly; chest retracted in clavicular regions; bacillus of tuberculosis was abundant in sputum. The disease rapidly progressed, and was uninfluenced by treatment. Patient complained greatly of night sweats during the first two months of his time at the hospital, but after this they ceased; had regular evening rise of temperature; temperature was normal June 6 to June 20; again from June 28 to July 3; had little or no fever after July 24. After July 28 dyspnoea was marked; July 29 there was considerable œdema of the feet and ankles. Emaciation steadily progressed, and cough became more and more distressing. Died August 13 at 11 a. m.

Necropsy (twenty-four hours after death).—Post-mortem lividity absent; rigor mortis slight; great emaciation; pupils dilated. Pericardium normal; pericardial sac contained 45 c. c. of serous fluid. Heart weighed 230 grams; very flabby; right ventricular wall thin; tricuspid valve incompetent. Pleural adhesions were general over the left lung and over the upper lobe and posterior border of the right; bronchial glands enlarged on both sides. Left lung weighed 870 grams; upper lobe contained a large cavity full of cheesy pus; similar smaller cavities were scattered throughout the lung, and also innumerable small cheesy masses. Right lung weighed 1,180 grams, and presented the same characteristics as the left; the entire upper lobe was hollowed out by a cavity, so that its walls were collapsed. Peritoneal cavity contained some serous effusion; mesenteric glands enlarged. The stomach mucous membrane was congested, with sticky mucous adherent to its walls. The mucous membrane of the small intestine was congested in the lower portion; the large intestine contained a small quantity of partly formed fœces. Liver weighed 1,280 grams, was dark and congested. Gall bladder contained 10 c. c. of bile. Left kidney weighed 170 grams and was normal; right kidney weighed 170 grams and was normal. Urethra, bladder, and prostate normal. Supra-renal capsules each weighed 7 grams and were normal in appearance. Spleen weighed 125 grams and was normal. Brain weighed 1,180 grams; there was a slight infiltration of the dura mater along the longitudinal fissure.

F. I.

CASE 46.

Tubercular meningitis.

O. K.; aged 35 years; nativity, Finland; was admitted to the United States Marine Hospital, port of San Francisco, Cal., May 2, and died September 6, 1898.

History.—The patient had been under treatment previously for tubercle of lung and returned with disease much advanced. On his last admission he complained of severe cough, profuse yellow expectoration, pain in left side, night sweats, loss of appetite with fever at night, and progressive emaciation and weakness. The case presented no feature of interest. Tubercle bacilli were abundant in the sputum and a large percentage of albumin found in the urine. Treatment was supportive and stimulating with abundance of milk, eggs, etc. On August 26, to

combat the increasing weakness, a kilo of normal salt solution was injected subcutaneously in the mammary. Delirium with partial suppression of urine supervened forty-eight hours before death, which occurred in coma.

Necropsy (four hours after death).—The body is that of a fairly well developed, poorly nourished, middle aged white male. Rigor mortis present in the arms only. The pupils are slightly dilated, the diaphragm is well arched, the intestines are anemic, the small intestine is empty, the large intestine is distended with gas. Abdomen contains 150 c. c. of a white serous fluid. Both lungs moderately distended. The right pleural cavity is almost obliterated by adhesions; the left pleural cavity is entirely obliterated. The pericardial sac contains about 30 c. c. of serous fluid. Both sides of the heart are contracted. The large vessels are not distended. The right ventricle contains a gray fibrous ante-mortem clot and sanguineous fluid. The right auricle contains post-mortem clots. The left ventricle is empty. The heart weighs 330 grams. The walls are normal in thickness and texture. The aorta contains organized clot. All the valves are competent. The left lung weighs 575 grams. There is an abscess in the apex and numerous other small abscesses throughout the left lung. The right lung weighs 730 grams and has an abscess in the apex, and other abscesses scattered in its substance. The liver weighs 1,605 grams, and is congested. The left kidney weighs 197 grams; the right kidney weighs 227 grams. Both kidneys are surrounded by a large amount of adipose tissue and both are anemic. The left suprarenal body weighs 22 grams. The spleen weighs 187 grams, and the capsule is firmly adherent. There is a discharge of pus from the right ear. The pia mater is very greatly engorged. A number of tubercles are present on either side of the longitudinal sinus at the vertex. There is a distinct exudation at the base of the brain. This is grayish in color and of the consistency of jelly, and exists, in a slight degree, over the rest of the cerebral surface. There is an abnormal amount of cerebrospinal fluid in the cranial cavity, and it is grayish and turbid in appearance. The right mastoid cells were opened and found to contain a thin purulent fluid.

S. O. B.

T. B. P.

J. M. G.

CASE 47.

Valvular disease of heart.

J. M.; aged 50 years; nativity, Maryland; was admitted to the United States Marine Hospital, San Francisco, Cal., December 12, and died December 14, 1898.

History.—Family history was negative. The patient had never been sick before. His present illness began in July, 1898. At that time was exposed to inclement weather very much and caught cold. Since then he has had a cough which was worse at night than in the day time. With this cough he raised large amounts of thick yellow slime. Had pain in the thoracic region, particularly on lying down. On account of pain he was unable to lie on the right side. He had lost 20 pounds in weight since July, felt very weak, and got short of breath on slight exertion. The respiration was noted to have a wheezing quality. He had œdema of the feet and of the legs as high as the knees. He stated that at times the thighs also became swollen. On inspection the patient was noted to have a dusky and somewhat cyanotic appearance. He complained of vomiting within fifteen minutes after eating. Bowels were constipated. The patient was much emaciated and both supra and infra clavicular spaces were sunken. On percussion was found a dullness of the upper portion of the right lung extending in front from the apex to the second rib and behind from the apex to fifth dorsal spinous process. The entire lower lobe of the right lung was dull. The rest of the area of the thorax was hyperresonant and the patient had a decidedly barrel-shaped thorax. Bronchial breathing could be heard over the apex of the left lung and over almost the

entire surface of the right lung. The heart area was normal in size and position. A very faint murmur could be heard at the apex with the systole of the heart. The respiration was 36 and the pulse 120 per minute. December 13 the urine was examined and a large amount of albumin found. Death occurred December 14 at 1 p.m. Treatment consisted of tincture of digitalis 10 minims three times a day, a mixture to alleviate cough, and Basham's mixture.

Necropsy (four hours after death).—The body is that of a fairly well developed, but very poorly nourished adult, mulatto male, of medium size. Rigor mortis is present. The peritoneum is normal. The small and large intestines are both distended with gas, but there are no pathological changes in them, except at the pyloric end of the stomach, which is adherent to the under surface of the left lobe of the liver, near the great longitudinal fissure. The pericardium is thickened, and contains 110 c.c. of clear yellow fluid, with a few flakes of fibrin. The surface of the heart is normal, but the coronary vessels are slightly congested. The wall of the left ventricle is thickened, and the cavity contains some clotted blood. The mitral valve is incompetent, but all the other valves are normal. Its weight is 410 grams. The left lung is slightly oedematous, but crepitation is present. Its weight is 570 grams. The right pleural cavity is almost entirely obliterated by adhesions between the lung and chest wall. The right lung is completely filled with tubercular masses, and the superior lobe has a hard, brawny feeling. There is no crepitation in this lung. The middle lobe contains an abscess cavity, irregular in shape, ramifying through almost the entire lobe, and containing a yellow, thick, foul-smelling pus and masses of broken-down tissue. The inferior lobe contains a similar pus cavity, but of smaller dimensions. The rest of the inferior lobe is hard and nodular. The weight of the right lung is 1,350 grams. The liver is enlarged, pale in color, and on section presents a mottled appearance. Its weight is 2,120 grams. Both kidneys are slightly congested, but their capsules peel easily, and they are otherwise normal. The left weighs 180 and the right 160 grams. The suprarenal bodies are normal. The spleen is normal and weighs 155 grams. The encephalon is normal in appearance, both on its surface and on section. It weighs 1,270 grams.

T. B. P.

J. M. G.

CASE 48.

Valvular disease of heart.

F. C.; aged 32; transferred from Milwaukee, Wis., to United States Marine Hospital, Chicago, Ill., October 9, 1897; died October 27, 1898.

History.—Physical examination: A murmur was heard at the apex with the second sound. Lungs showed signs of tubercle. Examination of sputum showed large numbers of the tubercle bacilli. Supporting treatment was given and for the last two months morphia to ease his pain. This made him comfortable to the end.

Necropsy (twelve hours after death).—Body greatly emaciated, estimated weight 100 pounds. Hands and feet oedematous. No rigor mortis. Post-mortem congestion very slight. The skull-cap brain case sinuses and membranes were normal. The brain weighed 1,450 grams and was normal in appearance. The anterior mediastinum was normal. The heart weighed 440 grams and was in systole. The mitral valve was incompetent, the edges of the leaflets being slightly curled and contained some small calcareous plates. Several small vegetations were found on their edges. The other valves appeared normal. The pericardium contained about 50 c. c. of clear fluid and was normal. In the apices of the lungs there were many tubercles and small cavities containing pus. The lower lobes of the right also showed the disease. Both were so bound down by old pleural adhesions it was impossible to remove them so they could be weighed. The great vessels

and nerve trunks were normal. The omentum was very small and contained no fat. The spleen weighed 160 grams and was normal in appearance. The kidneys were normal. Capsules nonadherent. Right weighed 190 grams, the left 240. The urinary bladder contained about 25 c. c. urine and was normal. The organs of generation were apparently normal. The rectum, duodenum, and stomach were normal. The gall bladder contained about 50 c. c. bile. Its ducts were patulous. The liver weighed 1,740 grams. Capsule was slightly adherent. Showed no sign of amyloid degeneration. The pancreas was normal. The large and small intestines were smaller in caliber than normal. Contained a little fecal matter. They showed no sign of tubercle.

H. C. R.
H. W. S.

CASE 49.

Valvular disease of heart.

C. W., aged 42; born in Kentucky; admitted to Marine Hospital, New Orleans, La., November 21, 1898; died December 2, 1898.

History.—Patient had been sick about one month when admitted, has had chills followed by fever—cough increasing in severity, gradually getting worse, appetite poor, bowels costive, and has suffered from loss of sleep. Examination of chest: Moist rales heard over both sides of chest. A valvular murmur heard over apex and aortic areas, systolic. Under treatment cough became less frequent, expectoration free mucopurulent. Continued to be weak; pain developed in left side of chest worse on coughing. On November 29 complained of pain at base of right lung, bronchial breathing. There is a friction murmur over fifth rib front. Presystolic murmur over aortic area and systolic murmur at apex continues. Respiration increasing in number 34 per minute. Pulse, 94; temperature, 39.4. Expectoration white, glutinous, and adhesive. Pain in chest continues more severe on coughing and deep respiration. Coarse rales heard over upper and lower lobes.

December 1.—Increasing dullness over upper lobe, moist sounds heard over upper and lower lobes.

December 2.—Dullness over whole of right side of chest, and coarse rales everywhere. Stimulants and expectorants given. Signs of consolidation in right lung followed by deficient aeration and increase of coarse mucus rales, and deficient respiratory movements. This was soon followed by signs of oedema of left lung, hypostatic congestion, cyanosis and death from exhaustion.

Necropsy.—Body that of a man fairly well nourished, 6 feet tall, and would weigh in good condition 160 pounds. Rigor mortis well marked. Has a scar on left thigh and over left tibia; also over right tibia a pigmented scar. Post-mortem lividity. Intercostal spaces depressed. Old fibrinous adhesions over right lung more numerous in front. One firm old adhesion in front on left side. On right side were some recent adhesions. Right lung weighed 1,860 grams. Adhesions existed between upper and middle lobes and posteriorly between upper and lower lobes. Crepitation in middle and lower lobes, upper lobe felt solidified. Lower lobe indented on pressure due to oedema. On section large amount of sero-purulent fluid exuded from section of middle and lower lobes. Upper lobe on section is dense, no fluid exudes, is friable, and shows myriads of tubercles where the tissue is torn. Left lung weighs 950 grams; mottled; tendency to the formation of a middle lobe, there being some deep sulci in upper lobe; on section frothy fluid exudes. Heart weighs 365 grams. Aortic valves contain calcareous deposits and atheromatous patches exist over surface of ascending aorta. The deposits on valves look like fish teeth and prevent the valves from falling to side of the aorta and a complete closure of orifice. Spleen weighs 705 grams; has omentum adher-

ent to it; soft and friable; capsule adherent. Liver weighs 2,660 grams; convex surface has several cicatrices extending 1 cm. into its substance; capsule is non-adherent, except at points of cicatrices; left kidney weighs 230 grams; capsule nonadherent; section gives a normal appearance. Right kidney weighs 195 grams; capsule nonadherent and normal in section. Brain weighs 1,436 grams; normal in appearance.

R. H. VON E.
H. R. C.

CASE 50.

Tubercle of intestines.

S. J. (colored); aged 24; nativity, Virginia. Admitted to marine ward, St. Vincent's Hospital, Norfolk, Va., February 20, 1899. Died February 22.

Previous history.—The patient had been sick two months with cough, severe diarrhea, griping, and tenesmus. His condition was very low when admitted, and a definite history could not be obtained of his sickness. There was slight fever, with evidence of peritonitis, somewhat localized on the left and lower part of the abdomen. There was consolidation of the upper portions of both lungs and a cavity in the left one.

Necropsy (twenty hours after death).—No post-mortem lividity. Rigor mortis absent. General nourishment poor. The pericardium contained about 50 c. c. of clear serum. The membrane was smooth and bright. All the valves of the heart were normal, and the muscular substance was healthy in appearance. The aorta was normal. The left pleural cavity was obliterated by adhesions. There were several cavities of varying size in the upper lobe of the left lung, and the remaining tissue was solidified. Patches of tubercles were found in the other lobe. The right pleural cavity was clear of adhesions. The lung was much solidified in the upper lobe, and the lower lobes were invaded with tubercles. The abdomen contained purulent serum and fibrinous flakes in the lower part, and the peritoneum was inflamed in the lower and posterior part of the abdominal cavity, and the viscera were adherent there. The mesenteric glands were greatly enlarged and cheesy. There was a perforating ulcer of the ileum a little above its termination in the cæcum, and a little higher another ulcer, which had reached the peritoneal layer and affected it. There was an abscess cavity about 4 cm. in diameter at the base of the appendix, surrounded by adhesions and emptying into the cæcum. The liver and the kidneys were found normal in appearance. The spleen was enlarged. Its tissue was dark in color and soft in consistence. The cranium was opened and the brain examined. Nothing notable was found there.

A. C. S.

CASE 51.

Tubercle of peritoneum.

W. B.; aged 26 years; nativity, Mississippi; admitted to United States Marine Hospital, Baltimore, Md., March 8, 1899; died March 30, 1899.

History.—Family history and previous personal history negative. Patient was taken sick while on duty, and when admitted to the hospital was very weak and apathetic. He said he had been feeling sick for some weeks, but gave no symptoms. His tongue was heavily coated, and he had a constant diarrhea, the discharge being gray in color and very offensive. His appetite was good. He had a slight cough with scanty expectoration, in which, after several examinations, a few tubercle bacilli were found. On examination of his chest there was dullness of the right apex and subclavicular region, with crepitation and bronchial breathing. He was emaciated and very weak. Felt no pain but on deep palpation of the abdomen. The rigidity of the muscles prevented successful examina-

tion. He had night sweats and chills, and his temperature varied from subnormal to 39°, usually being about 38° C. He was put on milk diet and given opium and astringents. The diarrhea was controlled, but the patient steadily became weaker in spite of a rich diet and stimulants, and finally sank into coma, which lasted for two days before death.

Necropsy (fourteen hours after death).—Body greatly emaciated. Cadaveric rigidity and lividity well marked. Skull-cap removed, dura torn, and a good deal of dark blood escaped. Surface of brain shows congestion. On section the brain substance and ventricles are normal. Weight of the brain, 1,320 grams. Abdomen opened by median incision. The omentum found much thickened—studded with tubercles from the size of a pin-head to that of a small pea, and adherent to both visceral and parietal layers of the peritoneum. The intestines were closely adherent, the adhesions being separated with difficulty, and the entire surface of the peritoneum showing tubercular infiltration. Thorax opened. Pericardium incised, and contained about 50 c. c. of yellowish fluid. The pericardium was bound down to the pleura on both sides. Heart: Weight, 340 grams; enlarged and contained white clots and dark fluid blood in every cavity. Left ventricle greatly thickened on outer wall. Both coronary arteries sclerotic. Large vessels normal. Left lung: Adherent opposite pericardium; free elsewhere; weight, 900 grams; showed slight congestion on surface and on section. Right lung: Adherent to pleura—densely consolidated, resembling gray hepatization of pneumonia; weight, 1,550 grams. Liver: Weight, 1,840 grams, slightly congested on section. Spleen: Weight, 195 grams; adherent to intestines and parietal peritoneum; normal on section. Pancreas torn up in effort to remove it from adhesions; fragments appeared normal. Right kidney: Weight, 160 grams; normal in appearance. Left kidney: Weight, 130 grams; normal in appearance. Intestines congested and closely stuck together. Peritoneal coat studded with tubercles. Peyer's patches shown prominently and were congested. Bladder normal. Testicles and seminal vesicles not examined.

S. R. T.
G. P.

SYPHILIS.

CASE 1.

Hemiplegia.

A. A.; aged 42 years; nativity, Sweden: admitted to United States Marine Hospital, port of New York, N. Y., September 20, 1898; died October 2, 1898.

History.—On admission patient was in an aphasic condition—unable to tell his own name or anything about himself. Both of his right extremities were paralyzed, as was the left side of his face till recently. Lesions of syphilis were seen over his body and limbs. There were scars from an eruption once over body, enlarged lymphatic glands, and exostosis on tibiae. A history of chancre on penis three years ago followed by an eruption, sore throat, and sore eyes was given. His present condition came on gradually, beginning about February, 1898. By July, 1898, he was unable to move right limbs and the left side of his face. His power of speech also became gradually impaired, being much worse at times. The last five days of his life he could not speak at all. The latter part of August he went to the marine-hospital officer in New Haven, Conn., and was treated by him till September 20, 1898, when he was transferred here. In his transfer it was stated that he had improved somewhat under the use of potassium iodide. While here his condition gradually became worse till October 2, 1898, when, within half an hour, his respiratory rate was increased from 22 per minute to 66 (being stertorous), his pulse from 76 to 168, and his temperature from 37.2 to 40.8 with congestion of lungs.

Necropsy (fifteen hours after death).—Man apparently about 50 years of age. Numerous scars (syphilitic) over body and limbs; exostosis on tibiæ. Radial arteries very sclerotic. Pupils evenly dilated. Rigor mortis and suggillation marked. On entering the abdomen the intestines are seen to be congested slightly. Posterior of abdominal viscera normal. On opening the thoracic cavity no fluid is found there, but the pleura of the left wall is seen to be adherent to that of the left lung. Seventy-five c. c. of serum is removed from the pericardial sac. A considerable quantity of fat is seen over both auricles of the heart and the left ventricle. The right side contains 300 c. c. of dark-red blood—no clots. The left side is empty. The whole heart is flabby, in the state of diastole. It weighs 225 grams. The aortic valves are thick and sclerotic, as is the aorta. Several calcareous deposits are felt about the mitral valves. The upper and lower lobes of the right lung are considerably congested, as is the lower lobe of the left. They are both crepitant, however, and are otherwise normal. There is no consolidation of either, nor are there any deposits. The right weighs 625 grams and the left 675 grams. The spleen and liver are of normal appearance and consistence, as are both kidneys. Each kidney weighs 200 grams. There are no deposits in either of these organs. On removing the skull the dura mater is seen to be white and non-adherent. The vessels of the pia are seen to be congested, but no signs of hemorrhage are to be seen. No tumor can be seen on the surface of the brain. On section, the brain substance has a normal appearance, except that about the internal capsule of the left lobe there is an area of a darker color than the adjacent brain matter, which, when felt, is much firmer. It resists being mashed out between the fingers. It has the appearance of a cicatrix. On section no hemorrhage can be seen.

R. C. C.

G. W. S.

CASE 2.

Gumma of brain.

C. J.; aged 27 years; nativity, Norway; admitted to United States Marine Hospital, Boston, Mass., November 23, 1898; died February 11, 1899, at 11.30 p. m.

History.—Patient could not give any intelligible history and appeared dazed and unable to understand what was said to him. He had a chancre three or four years ago with subsequent secondary symptoms. On admission, left eyelid was closed, and examination showed a complete paralysis of the third cranial nerve on that side, resulting in ptosis, paralysis of the sphincter pupillæ with consequent dilatation of pupil, and paralysis of all the muscles of the eye except the external rectus and superior oblique. Intraocular tension was somewhat increased, and eyeball seemed to protrude. Muscles of left side of face were paralyzed, and saliva dripped from mouth. Tongue deviated slightly to right side, and speech was much impaired. First noticed difficulty in articulation a month previously. Eye had been affected only two weeks. Both the upper and lower extremities of the right side were slightly affected, sensation and motion in each being diminished, being more so in arm than leg. He complained of pain in left eye and left side of face. Patella reflex on right side was exaggerated. Treatment was increasing doses of iodide of potassium, under which patient improved for a time, but relapsed, lost ability to speak or swallow, sunk into a comatose condition with stertorous breathing and died.

Necropsy (twenty-six hours after death).—Body well nourished; rigor mortis complete; post-mortem lividity present; pupils equally dilated. Pericardium was congested. Heart weighed after opening 315 grams; right side was much congested. Right ventricle contained a white clot, and its walls were thin, relaxed, and flabby. The right auricle presented on its walls externally white calcareous spots. The valves were all normal and competent. The two layers of the pleura

were not adherent. The left lung weighed 470, the right, 410 grams. Both were slightly congested, and the large and small bronchi contained a muco-purulent exudate. The position of the abdominal viscera was normal. The liver weighed 1,720 grams. The gall bladder was distended with bile. The pancreas weighed 100 grams. The left kidney weighed 175, the right, 160 grams. Both were normal. Both suprarenal bodies gave evidence of degeneration. The spleen weighed 105 grams, and presented a small, fibrous mass on its upper surface. The appendix vermiformis was 7 inches long, of unusually large diameter, and contained feces. The dura mater was adherent along the longitudinal fissure. There were two hard white nodules on inner side of the dura mater in the left temporal region. There was an excess of fluid at the base of the brain. The brain weighed 1,270 grams. Occupying nearly the whole of the left temporal region was a large broken-down gumma the size of a lemon. The meninges covering it were much thickened and the bony coverings slightly eroded. The amount of ventricular fluid was increased on the left side.

F. I.

ALCOHOLISM.

CASE 1.

Acute.

P. M.; aged 38; nativity, Prince Edwards Island; entered United States Marine Hospital, Boston, Mass., August 16, 1898; died August 21, 1898.

History.—Patient was brought to the hospital in a condition of profound drunkenness, and was unable to give any account of himself; had evidently been on a prolonged debauch. On admission his pulse was rapid and full, pupils dilated, face flushed, and intelligence completely suspended; would answer questions with incoherent mumblings; breath had an alcoholic odor. He never regained consciousness, but lay in a semicomatose state. Could be aroused sufficiently to take nourishment and medicine. August 20 he began to decline, his pulse growing weaker and more rapid, and on August 21 he died.

Necropsy (twenty hours after death).—Post-mortem lividity marked; rigor mortis pronounced; general nourishment fair; pupils dilated. Heart weighed 370 grams, pericardium normal, and valves competent. Left lung weighed 1,500 grams; pleural adhesions at apex; right lung weighed 1,280 grams; pleural adhesions general; tubercular processes general throughout both apices. Liver weighed 1,629 grams; fatty degeneration more marked in right lobe; gall bladder and ducts much distended. The mucus membrane of the stomach was much thickened and coated with a sticky mucus. Spleen weighed 180 grams and was normal. The kidneys each weighed 190 grams, and the cortical portion was much narrowed; pus in the pelvis of the left kidney. The arachnoid membrane of the brain was much congested, especially in the parietal regions; brain weighed 1,350 grams, and presented a normal appearance.

F. I.

CASE 2.

Fatty degeneration of heart—Congestion of lungs.

J. W.; aged 40 years; nativity, Ireland; admitted to the United States Marine Hospital, port of San Francisco, Cal., June 5, and died June 9, 1899.

History.—The patient said that he had been constantly drunk since April 11. About May 1 his stomach became irritable and diarrhea set in. He had been losing weight and strength; felt nervous and shaky, and slept very little; had constant headache and hallucinations, both visual and auditory.

June 6.—The patient seemed better and was rational. He slept only an hour or two last night.

June 7.—Very restless during night, morphine hypodermically and paraldehyd being administered without perceptible effect. In the morning, patient exhibited marked tremor and was agitated by terrifying hallucinations, chiefly visual. Pulse weak and rapid.

June 8.—General condition less favorable. He was violent all night; hallucinations more pronounced; tongue dry; face bathed in sweat: pulse weak and rapid; temperature in axilla, 39° C.

June 9.—Yesterday at 6 p. m. patient was given hyoscine hydrobromate, 0.0006 gram. After taking this he slept until 12 midnight. Patient died at 5.15 a. m.

The treatment of this case was sedative and supporting. Various hypnotics were exhibited, without, however, any very evident effect.

Necropsy (five and one-half hours after death).—The body is that of a well-developed, well-nourished adult white male. Rigor mortis is present. The stomach greatly distended with gas and liquid. The anterior surface of the lungs is apparently normal. The anterior surface of the heart is covered by a considerable amount of fat. Heart weighs 310 grams. Several small white atheromatous patches are seen at the beginning of the aorta. All the valves are normal. The left lung weighs 545 grams. The cut surface is of an intense dark color and from it exudes copiously a red frothy blood. Congestion more marked posteriorly. Excised portions of the lung float in water. The right lung weighs 700 grams; closely resembles left, except that the congestion is more marked. Liver weighs 1,670 grams. Gall bladder distended with bile. Liver contains large amount of blood. The cut surface seems slightly paler than normal. Spleen weighs 115 grams; is apparently normal. Left kidney weighs 125 grams. Capsule slightly adherent. At the center of one of the median pyramids is found a firm white nodule about the size of a pin head. The right kidney weighs 110 grams. Blood vessels of cortex injected; capsule somewhat adherent. The bladder contains about 20 c. c. of turbid ammoniacal urine; wall apparently thickened; blood vessels injected. Stomach markedly dilated, containing about 200 c. c. of a greenish bile-stained fluid. Lining mucous membrane quite pale—apparently the seat of a fatty degeneration—and covered with a tenacious mucus. All the viscera of the trunk were loaded with fat. The brain weighs 1,430 grams. The dura mater considerably congested, especially posteriorly, where the congestion is apparently hypostatic. Arachnoid markedly opaque; subarachnoid fluid increased. The blood vessels of the pia mater markedly congested. The pia mater in various positions, but especially over the convexity, presents a peculiar opaque appearance, suggesting inflammatory changes. Pia mater strips off readily from subjacent brain substance. On opening the lateral ventricles a normal amount of clear serous fluid is observed. The choroid plexuses of both lateral ventricles present a cystic appearance, the larger cysts averaging 0.5 cm. in diameter. They contain a clear serous fluid. Apart from marked evidences of congestion the rest of the brain is apparently normal.

D. M.

W. J. L.

J. M. G.

Microscopical examination.—Specimens hardened in Müller's fluid. Brain: No apparent abnormality. Kidney: Slight parenchymatous change in tubular epithelium. Capillaries dilated. Liver: The great majority of the liver cells contain fat droplets, in many cases the fat droplet being single and larger than the normal liver cell; in other instances the cells contain several small droplets showing less tendency to coalesce. The capillaries are distended. Interlobular connective tissue not excessive.

D. M.

MENINGITIS.

CASE 1.

G. L. M.; white; age, 22; nativity, Michigan; admitted to the United States Marine Hospital, Detroit, Mich., January 13, 1899; died January 28, 1899.

History.—On admission to hospital patient gave neither syphilitic nor tubercular history, and, in fact, no history of any previous sickness or injury, but has had some mental worry, extending over the past six months. About ten days ago he began to complain of slight headache, coming on daily, and general malaise. Four days before admission patient had a severe chill, followed by increased temperature, intense headache, and dull, aching pains, radiating over back and legs. The case previous to admission was treated as influenza, and this diagnosis was agreed to at time of admission, the headache and pains in back continuing, pharynx being reddened, tonsils swollen, tongue highly coated, bowels constipated, and temperature 37.8° C. A few mucous râles were heard over anterior surface of chest and a well-marked systolic murmur over nipple. Patient was given calomel, followed by coal-tar preparations.

January 17.—Headache became much more severe and constant, patient suffering intensely, and being only partially relieved by anodyne. Later he became very restless, sleeping scarcely any and moaning continually, and from this passing into a low, muttering delirium. Temperature was very irregular and below 38° C. during first ten days of sickness, when it ran as high as 39° C. for two days, then became subnormal, and the day before death went up to 40° C. Urinary examination failed to show albumen at any time, and there was no muscular rigidity nor vomiting at any period of sickness. For two days previous to death there was a condition of paralysis of bladder and rectal muscles, patient lying in a comatose state and dying unconscious at 3.30 p. m., January 28, 1899.

Necropsy (fifteen hours after death).—Rigor mortis exceedingly well marked; abdomen tense; body somewhat emaciated; ecchymoses on sides of chest and back. Calvarium very thin; diploë small in amount, and on removal dura was found slightly attached along longitudinal sinus. Cranial vessels prominent and filled with dark fluid blood. Dura reddened, roughened on under surface and bound down to pia on both sides at great longitudinal fissure by fibrinoplastic adhesions, stronger and more numerous on left side. They were easily separated anterior to fissure of Rolando, but firmer posterior to this over quadrate and superior parietal lobes. Gray and white matter of the cerebral hemispheres and cerebellum apparently normal; puncta-vasculosa prominent. An increase of sero-sanguinous fluid was found in ventricles, and the choroid plexuses of the descending cornu of fourth ventricle were reddened, thickened, and congested, showing upon their surfaces a slight deposit of lymph. Corpus callosum was very friable, being easily broken down by stream of water. The basal ganglia appeared normal in structure. On opening thoracic cavity right pleura found smooth; fluid normal in quantity; right lung unattached; left lung attached firmly at base by old pleuritic adhesions; both lungs very much congested. Pericardiac cavity normal, containing about 25 c. c. of straw-colored fluid. Heart normal in size; both sides filled with dark fluid blood; heart muscles showed no degenerative changes; mitral valves roughened and insufficient. Spleen somewhat small. Kidneys and ureter normal; bladder empty. Intestines and stomach distended with gas; liver congested; gall bladder partially distended with bile; bile ducts patent.

L. D. F.
J. G.

CEREBRAL HEMORRHAGE.

CASE 1.

Secondary syphilis.

C. S. (colored); aged 45; born in Canada. Admitted to United States Marine Hospital, Chicago, Ill., January 8, 1898. Died December 20, 1898.

History.—This patient was transferred from Detroit, Mich. He gave a history of syphilis followed by a cerebral hemorrhage. The right side was incompletely paralyzed, the tongue also being affected. Patient was about most of the time while at this hospital. He had several convulsions, epileptic in character, which confined him to bed for several days. About three weeks before death patient suddenly refused his food. Forced feeding and nutrient enemata were resorted to. Patient gradually sank into a semicomatose condition, which deepened into coma. Death on December 20, 1898. The treatment was specific and hygienic.

Necropsy (ten hours after death).—Body of a negro: estimated weight, 150 pounds. Rigor mortis slight. The right arm and leg slightly smaller than the left. The skullcap rather thin for a negro. Brain case was normal. The vessels and sinuses were apparently normal, the latter being empty of blood. The brain weighed 1,200 grams. In the left hemisphere in the Rolandic region there was a large cavity of about 25 c. c. capacity which was separated from the lateral ventricle by a thin membrane. Posterior to this cavity a small strip of good brain tissue about 2 cm. in width was found which divided a smaller cavity, about 5 c. c. capacity, from the larger one. Both were filled with a thin colorless fluid. There were a few adhesions between the dura and arachnoid at the base. The anterior mediastinum was normal. The heart weighed 270 grams. Its valves were all competent. Was pale, flabby, and the apex was fatty. The pericardium was normal and contained no fluid. The right lung weighed 570 grams, the left 270 grams. They were collapsed, but crepitant. No lesion could be found. The pleuræ were normal. The great vessels and nerve trunks were normal. The omentum contained a great deal of fat and was larger than usual. The spleen weighed 45 grams. It was very tough on section, and was torn with difficulty. The capsule was adherent. The right kidney weighed 140 grams, the left 150 grams; their capsules were nonadherent. They presented no evidences of disease. The urinary bladder was normal. It contained no urine. The organs of generation were normal. The rectum was filled with fecal matter. The duodenum contained a little semisolid fecal matter. The stomach was normal and contained a little partially digested milk. The liver weighed 1,170 grams; was tough on section. Capsule was nonadherent. The pancreas was normal. The solar plexus was apparently normal. The small and large intestines were smaller in caliber than usual, and contained throughout their extent small masses of semisolid fecal matter. The great vessels were normal.

H. C. R.

H. W. S.

CASE 2.

F. B. (colored); aged 55; nativity, Ohio; was admitted to the United States Marine Hospital, New Orleans, La., October 11, 1898, and died October 17, 1898.

October 11.—While at work he was suddenly taken with a severe shock. His whole right side became paralyzed. Respiration stertorous. Right side of forehead lost its wrinkles. Could swallow some milk.

October 12.—Swallows less readily. Respiration snoring in character. Much mucus in trachea, giving coarse râles when he respires. Can not possibly protrude his tongue. Given an enema of warm milk, 150 c. c., every four hours. Hypodermic of strychnine sulphate, gm. 0.001, and ergotine every four hours.

October 15.—Feels and appears better. He drinks milk now. Controls urine and feces. Pulse fair. The mucus which rattled in his throat has diminished. Respiration less stertorous.

October 17, a. m.—Seems quite bright. Drinks well. Says he has no pain. Breathes fairly easy. 6 p. m.: Was taken worse about 5 p. m. Respiration became labored, rapid, and stertorous. Unconscious. Respiration could be heard the length of the ward. 9 p. m.: Patient very weak. Respiration Cheyne-Stokes in variety. Extremities cold. Pulse very weak. He died at 9.50 p. m.

Necropsy.—Body that of a well-nourished man, about 1.5 meters tall. Head bald. There was evidently much subcutaneous adipose tissue. The body would weigh 104.5 kilos. Rigor mortis well marked. Incision through scalp and pericranium gave exit to much venous blood. The skull was of normal thickness. Dura mater normal. A few adhesions between dura mater, arachnoid, and pia mater along each side of the longitudinal sinus. Removal of the calvarium and dura mater showed the pia mater much congested. The vertebral arteries showed patches of atheromatous degeneration. Similar changes were apparent throughout the circle of Willis and in the anterior and posterior cerebral arteries. The vertebral arteries communicated with each other about 2 cm. from their final junction to form the basilar artery. A small embolism had plugged the antero-lateral ganglionic branch of the middle cerebral artery. Softening had taken place, but no hemorrhage, in the posterior part of internal capsule. The softened area was about 1 cm. in diameter. The corpus striatum and optic thalamus were markedly anæmic. The puncta cruenta were evident for coarser vessels, but not for smaller. Brain weighed 1,360 grams. Heart was hypertrophied. The aortic valves were efficient. The valves had a deposit of lime salts along the whole border. They were quite stiff, and it seemed remarkable that they should prove efficient to the water test. Aorta: The aorta was 6 cm. across when opened and placed upon a flat surface. From the aortic orifice to the division into the common iliac arteries there was not a portion of normal intima. There was either atheromatous degeneration, deposits of lime salts, or erosions in the intima. This degeneration seemed universally present in arteries, whether large or small. The heart weighed 610 grams. The right pleural cavity was obliterated; the left was normal. Lungs: The lungs were normal, but for congestion due to feeble heart beats during the last few days of life. Right lung weighed 580 grams; the left 760 grams. Liver, normal; weighed 1,590 grams. Spleen, small, but normal; weighed 120 grams. Kidneys: The kidneys were congested. Left contained a recent clot at its upper end. The clot, or its cavity, measured 2 cm. in diameter. Left kidney weighed 130 grams; right, 170 grams. This was a case of renal apoplexy. Pancreas, normal; weighed 90 grams. Suprarenal capsules normal and weighed 5 grams each. Bladder: The bladder was normal and empty. Intestines were normal.

C. T. P.

ENDOCARDITIS.

CASE 1.

W. D. (colored); aged 33 years; a native of Louisiana; was admitted to the United States Marine Hospital, New Orleans, La., April 10, 1899; died April 17, 1899.

History.—He had had rheumatism several times. When admitted he had had a cough for three weeks. Cough accompanied by considerable expectoration and pain over the right lower lobe. There were dullness over the left lower lobe and increased area of precordial dullness. The apex was to left of the mammary line 6 centimeters and 8 below the nipple. There was a double bellows murmur at apex and over the aortic and pulmonary valves. There were moist râles over the left lower lobe. The patient seemed to do well from the time of admission. He

had recovered from the pneumonia, but the respiration continued fast. He was kept in a recumbent position for fear of cardiac failure. About 6 a. m. of the 17th instant, he arose from bed to urinate, contrary to instructions, and immediately became bathed in a cold perspiration: in a few moments he was dead from heart failure.

Necropsy (seven hours after death).—Body that of a man 1.7 meters tall, and would weigh 73 kilos. Long scar on lower lip, which he said was caused by falling on a broken bottle when he was 10 years old. There was a scar in the left groin caused by suppurative lymphatic glands. The surface of the body in many places was marked by copper-colored scars. Section of the body showed the lungs normal, except in the basal portion of the right lung; there was a hemorrhagic infarct which involved many lobules from which the blood had been absorbed and left them collapsed. The right ventricle was dilated and its walls of normal thickness. The left ventricle was normal. As the cavity of the right ventricle was much larger than normal, and its wall of normal thickness, it was dilated. The heart stopped in diastole. The pericardium contained 50 c. c. of serous fluid. The muscular tissue of the right ventricle was much paler than normal, because the right coronary artery was occluded at its origin from the aorta by inflammatory deposits. The inflammatory deposits were located within the heart near the aortic orifice along the valves and in the aorta near the aortic valves. The deposit near and upon the aortic valves was a recent one. There were also patches of the endocardium in different parts of the left ventricle that were also covered with false membrane. That this was a recent trouble was evident, because the muscles of the right ventricle had not undergone any degeneration, and the patches of thickened endocardium were surrounded by distended arterioles. The patches of new fibrous deposit in the right ventricle were upon the tricuspid valves. The aortic, pulmonic, and tricuspid valves were inefficient. The heart weighed 765 grams. There were no pleuritic adhesions. The right lung weighed 430; the left, 375 grams. Liver, normal, and weighed 1,890 grams. The gall-bladder was distended, but the ducts were pervious. Pancreas, normal; weighed 100 grams. Kidneys congested, otherwise normal; right weighed 195; left, 170 grams. Bladder empty; urethra and prostate normal. Spleen, normal; weighed 100 grams. Brain and its membranes normal; it weighed 1,280 grams.

C. T. P.

VALVULAR DISEASE OF HEART.

CASE 1.

Mitral.

W. N.; aged 44 years; race, white; nativity, Maine; occupation, seaman; admitted to the United States Marine Hospital, Boston, Mass., November 1, 1898; died November 11, 1898, at 11.30 p. m.

History.—Family history good. Had used tobacco moderately; alcohol frequently to excess. Always considered himself unusually healthy until two years before. At that time had an attack of rheumatic fever, since which he had frequently suffered with dyspnoea and swelling of ankles. Present illness commenced two weeks ago with dyspnoea and swelling of legs. On admission had severe orthopnoea; precordial pain; anasarca; entire loss of appetite; cyanosis, and great dyspnoea on slightest exertion, and insomnia; heart was much enlarged and apex beat displaced to the left; auscultation revealed a systolic murmur transmitted to scapula and axilla. Swelling was greatest in legs. Patient was put on milk diet, salines, and digitalis, and improved steadily until November 10, 1898; orthopnoea and anasarca disappeared entirely. On night of November 11 he went to the water-closet at 11.15 and was discovered there dead at 11.30.

Necropsy (twelve hours after death).—Body well nourished; rigor mortis complete; post-mortem lividity present; pupils equally dilated. Pericardial sac contained 25 c. c. of straw-colored fluid. Heart enormously hypertrophied and weighed after opening 775 grams. Left ventricle much enlarged and walls greatly thickened. Valves of the heart all competent with exception of mitral, which was thickened, irregular, and incompetent. Pleural cavity contained considerable fluid. Weight of left lung, 770 grams; adherent at base. Weight of right lung, 535 grams; extensive adhesions over apex and lateral border of upper lobe. Both lungs in a state of passive congestion. Fluid present in peritoneal cavity. Weight of liver, 1,870 grams. Weight of pancreas, 210 grams. Left kidney, 260 grams; right kidney, 285 grams. Weight of spleen, 170 grams. Brain weighed 1,510 grams.

F. I.

CASE 2.

Mitral.

H. P.; aged 37; nativity, Kentucky; admitted to the United States Marine Hospital, Cincinnati, Ohio, November 23, 1898; died December 21, 1898.

History.—Family history negative. Admitted the use of alcohol and tobacco in excess; denied syphilis. Patient had been complaining for about two months of pain in his chest (cardiac region), great dyspnoea, and general œdema and weakness. Physical examination: General anasarca present; hands, abdomen, external genitals, legs and feet being very much swollen. There was marked increase of cardiac dullness transversely, with a loud blowing systolic murmur. Urine contained small amount of albumen; no casts found. Patient steadily declined. Death occurred suddenly.

Necropsy (three hours after death).—Appearance of body, general anasarca present. Hands, abdomen, external genitals, legs and feet very much swollen. Rigor mortis absent, no discoloration of skin. Upon removal of skull cap membranes were found congested. There was excess of fluid in arachnoid spaces. Brain healthy; weight, 1,730 grams. Thorax: Pleural cavities contained a considerable amount of fluid, pleura nonadherent. Lungs normal, except lower lobe of each, which was in a state of hypostatic congestion; weight of right lung, 450 grams; left lung, 480 grams. Pericardium slightly thickened and contained small amount of fluid, 200 c. c. Heart hypertrophied; walls of ventricles very much thickened. Large ante-mortem clot filling cavity of right side. Mitral valve greatly thickened and incompetent. Tricuspid valve slightly thickened and showed patches of vegetative ulceration, incompetent. Other valves flabby but competent; weight of heart, 770 grams. Abdomen: Large amount of ascitic fluid, about 8,000 c. c. Liver congested, color deep brown; weight, 1,420 grams. Gall bladder distended with dark bile. Spleen normal. Both kidneys congested and slightly contracted; right kidney, weight, 150 grams; left, weight, 180 grams; pancreas weighed 95 grams, negative.

W. A. W.

J. W. S.

CASE 3.

Mitral.

W. C.; aged 60 years; nativity, Pennsylvania; admitted to the United States Marine Hospital at St. Louis, Mo., on November 19, 1898, and died January 2, 1899, at 3 o'clock p. m.

History.—The patient stated that he had had trouble with his heart for three years. He would have pain in his chest and shortness of breath on exertion and his feet would frequently become swollen; sometimes these symptoms would be worse than at others. For the last two months his bowels had been very loose

and he had passed his water as many as six times during a night. He had a cough, but it was not troublesome, and he had never expectorated blood. Physical examination: Chest broad, respiration 21 to the minute, shallow, and the respiratory murmur roughened; no râles heard over either lung; area of heart dullness very much increased; apex displaced downward and to the left. A rough systolic murmur heard over the whole cardiac region; pulse 72; intermits every second and third beat; tension high. Abdomen slightly swollen, due to ascites. Legs swollen and œdematous. Urine sp. gr. 1.021; one-half of 1 per cent of albumen present. After being in the hospital a few days the condition of the patient considerably improved, so that he was tolerable comfortable so long as he remained quiet. He became gradually worse from the 10th of December, his feet and scrotum were very much swollen, respiration embarrassed, and some blood was expectorated. His extremities, lips, and finally his whole face became blue. There were signs of œdema of the lungs on New Year's day, but he did not die until 3 p. m. the next day.

Necropsy (twenty hours after death).—Body: Large frame and well nourished; hypostatic congestion of lower portions; scrotum filled with fluid, making a tumor about as large as a child's head. Height, 180 cm.; dark chocolate fluid oozing from nostrils; abdomen distended; rigor mortis well marked. On opening abdomen yellowish white fluid flows out; abdominal walls 2 cm. thick; stomach and intestines of a dark pink hue, distended with gas; liver extends about $1\frac{1}{2}$ cm. below lower border of ribs; 1,500 c. c. of fluid in abdominal cavity. On opening chest both lungs and heart appear; lungs slate color, filled with dark spots; small quantity of fluid in each pleural cavity; pericardium contains about 25 c. c. of fluid; heart of enormous size, extending from middle of sternum to axillary line; heart and large blood vessels filled with dark fluid blood; weight of heart, 450 grams; length, 13 cm.; width, 13 cm.; thickness, 8 cm. Right auricle filled with dark clots; right ventricle also. Thickness of walls of right ventricle, 5 mm. Valves on right side normal. One leaf of mitral valve very small; the other leaf of normal size, but surface much roughened. Thickness of walls of left ventricle, 2 cm. Musculi papillaris very much thickened. A small spicula of bone found at base of one leaf of aortic valve; valve otherwise normal. Walls of coronary arteries thickened and partially calcified. Right lung soft and crepitant, 21 by 22 by 5 cm.; weight, 720 grams. On section apex of lung tissue found to be œdematous, reddish white fluid exuding on pressure. Base of lung harder than the rest and tissue on section very dark brown. Left lung tissue in same condition as right lung, 17 by 10 by 6 cm.; weight, 570 grams. Spleen 14 by 7 by 5 cm.; weight, 480 grams; very hard and tough. On section tissue of black color. Splenic artery very large and tortuous; walls extremely thick and calcified, so that it is difficult to cut the artery with a knife. Left kidney: Weight, 200 grams: shallow depression on upper external surface 1 cm. in diameter, 5 mm. in depth; circular outline, lined by part of the membrane covering outside of kidney; bottom formed of kidney substance; a number of smaller depressions also found filled with serum. The kidney tissue cuts with considerable resistance. Considerable fat in pelvis. Tissue of a brownish red color. Cortical layer 5 mm. in thickness. Pyramids dark at apex, with whitish striped appearance at base. Right kidney: Weight, 320 grams. Capsule firmly adherent. External surface rough, covered with large round elevations, most of them containing serous fluid. Large depression on external surface, $2\frac{1}{2}$ cm. in diameter. Pelvis filled with fat. Cortical portion 5 mm. in diameter. Pyramid dark at apex, streaked with white at base. Cavity size of a pigeon egg, filled with serum found in kidney substance. Stomach filled with dark fluid, about 500 c. c. No rupture of blood vessels in stomach. Mucous membrane of a dark reddish color, showing numerous and large blood vessels. Both abdominal rings large enough to contain two fingers, but no intestines in either canal. Liver 26 by 20 by

6 cm.; weight, 1,730 grams. Section shows minute gray and brown spots; in center of left lobe an irregular spot 3 cm. in diameter of a much lighter color.

W. G. S.

CASE 4.

Aortic.

N. B. M.: aged 60 years; nationality, United States; admitted October 14, 1898, to the marine ward, St. Mary's Infirmary, Galveston, Tex.; died October 17, 1898.

History.—The patient was very weak and dyspnoic when brought to the hospital. He stated that twenty years ago he had had rheumatism affecting the ankles chiefly, and at some time in the past two months he had had "fever" in Porto Rico. On admission the patient was anemic, feeble from a constant dyspnoea which increased at times to severe paroxysms of breathlessness. The patient could not lie down for any length of time. There was anorexia and insomnia. The urine was loaded with albumen. There was no cough. There was no oedema of the face, the dropsy being confined to the lower extremities. On physical examination a diastolic murmur was heard over the base and apex of the heart. Three days after admission the patient was taken with syncope while moving about the ward and died as soon as he reached his bed.

Necropsy (ten hours after death).—Body that of a well-developed man, 5 feet 7 inches in height. Rigor mortis disappearing. Front aspect of the body pale, with post-mortem lividity of the back. No evidences of decomposition. Lower extremities oedematous, incisions over the internal malleoli shedding a thin reddish fluid. Skull cap, brain case, sinuses, and membranes of brain normal. The cerebral cortex was oedematous and the superficial vessels distended with blood. The ventricles were filled with a clear fluid. Brain substance normal. Inspection of the abdomen negative. Thorax: Parietal pericardium normal, visceral pericardium showed abnormal increase of fat. There were 30 grams of a straw-colored fluid in the pericardial sac. Heart enlarged. Weight, 450 grams. Right ventricular wall normal in thickness, but the size of the cavity increased and containing 15 grams of black clot. Left ventricular wall also of normal thickness, but with enlarged cavity. The left cavity contained 25 grams of dark clotted blood. The auricles were normal in structure. The right auricle was dilated and contained 45 grams of black blood; the left auricle dilated and empty. Endocardium and valves normal: but the right auriculo-ventricular opening was enlarged, rendering the tricuspid valve incompetent. The sinuses of valsalva and the aortic orifice were dilated and the aortic walls in this region were atheromatous. From dilatation of the aortic orifice the aortic valves were rendered incompetent. In the right pleural cavity were 1,500 cubic centimeters of straw-colored fluid, containing shreds of organized lymph. The left pleural cavity contained 2,000 cubic centimeters of a fluid of similar character. There were old, firm adhesions between the parietal and pulmonary pleura over the anterior surface of the right lower lobe and at the apex and base posteriorly. There were also firm adhesions over the apex of the left lung. Both lungs were oedematous and the right contained calcareous tubercles in the upper part of the lower lobe. The left lung was anomalous in that the upper lobe was divided by a fissure, making a middle lobe. In the left upper lobe was a caseating tubercular area surrounded by fibrous tissue. Abdomen: The omentum was somewhat lacking in fat. The spleen, slightly reduced in size, was the seat of a connective tissue hyperplasia involving the parenchyma and causing thickening of the capsule. On the convex surface was a calcified cicatrix 6 by 3 by 1 cm. in dimension. The kidneys, normal in size, their capsules somewhat adherent, both presented the microscopic appearance of a chronic parenchymatous nephritis, but the right kidney was considerably darker in color than the left. There was a cyst, 1 cm. in diameter, at the upper extremity of the left kidney. The remainder of the genito-urinary tract was normal, with the exception of an hypertrophy of the lateral lobes of the prostate

which did not extend to the middle lobe. The bladder was empty. Rectum, duodenum, and stomach normal. The liver, of normal size, showed on the surface small stellate patches of connective tissue, which on section were found not to extend below the surface, of which they caused an unevenness. This viscus was adherent to the diaphragm from an old perihepatitis. The remainder of the abdominal contents presented no abnormal features. Spine: Examination of the cord and its membranes was omitted.

Microscopic examination.—The right kidney showed marked congestion, especially in the cortex, and a pronounced cloudy swelling of the cortical epithelium. There was a moderate cloudy swelling of the epithelium of the medulla and evidence of active interstitial inflammation. The left kidney showed the same condition in a less marked degree. There was less congestion and less inflammatory multiplication of connective tissue cells. The liver showed moderate fatty infiltration, degeneration (fatty), and atrophy of the cells about the central lobular veins, the result of pressure from prolonged venous congestion at these points. The usual pigmentation accompanying this change was also evident. No special cirrhosis and no cloudy swelling were present. The conclusions from the necropsy as to the cause of death in this case are as follows: (1) That there had been primarily a chronic nephritis, leading to an hypertrophy of the heart, with relative incompetency of the aortic and tricuspid valves from enlargement of the right auriculo-ventricular orifice. (2) That this compensatory cardiac hypertrophy in turn failed, giving rise to general œdema and finally death, the immediate cause of which was œdema of the lungs.

J. M. E.

CASE 5.

Aortic and mitral.

M. G. R.: aged 36; nativity, Ireland; admitted to the United States Marine Hospital at Baltimore, Md., November 7, 1898; died November 18, 1898.

History.—Admitted with a severe cough contracted October 18, 1898, while on the Great Lakes. One week previous to admission expectorated a small quantity of bright red blood. Physical examination led to a diagnosis of acute bronchitis; usual remedies administered. Several days later dyspnœa supervened, with pain in the chest and copious expectoration of frothy mucus tinged with blood. Sputum was not viscid. On reexamination of the chest areas of dullness, posteriorly, were discovered (upper part of middle lobe on right side and upper part of lower lobe on left side) and a double murmur over the heart. The former from a hypostatic congestion and the latter from mitral insufficiency and aortic stenosis accompanied by insufficiency. Second sound accompanied by a whistling or musical murmur heard very distinctly over the second costal cartilage on the right side. Corrigan pulse. Could only retain the lightest diet. Vomited regularly every day about 4 p. m. Shortly after this could retain no food in the stomach; stimulants barely tolerated. Dyspnœa, vomiting, and expectoration of sanguineous mucus, with pain in chest, continued until the end. Several hours previous to death complained of severe pain in the chest with sense of constriction and inability to move himself. Temperature during entire illness never above normal. Died very quietly November 18, 1898, at 10.40 p. m.

Necropsy (fourteen hours after death).—Height, 5 feet 11 inches; weight, 165 pounds. Rigor mortis. Body well nourished. One joint and a half missing from the second finger on the right hand. No other distinguishing marks. Chest opened; lungs and heart inspected before removal. Pericardium looked thicker than normal, and, on opening it, was seen to contain about 110 c. c. of a clear, straw-colored fluid. Interior surface roughened. On removing the heart a small patch of the pericardium was adherent to it, over the right ventricle. Many

small air vesicles were under the visceral pleura, anteriorly. Heart: Weight, 690 grams. Ceased in systole. Very large (20 by 12.5 cm.). Visceral pericardium roughened. Coronary arteries distended and prominently marked over the surface. Right auricle: Walls slightly hypertrophied. Distended with a large, dark clot. Right ventricle: Hypertrophy of walls, columnæ carnæ, and musculi papillares. Tricuspid valve normal. Large post-mortem clot entangled in chordæ tendinæ. Left auricle: Enlarged. Walls hypertrophied. Very little clotted blood. Mitral valve on this side was rough on each leaflet down to within 5 cm. of the free edge, from whence large vegetations, some sessile and some pendulous, extended to the edge. One pendulous mass hung into ventricle below. Left ventricle: Columnæ carnæ and musculi papillares of immense size. Walls hypertrophied. Under surface of valve showed no diseased areas. Contained post-mortem clot. Aorta: Smaller than normal. Valve (semilunar) thickened and somewhat rigid. Vegetations on free edge of valve segments exactly similar to those on mitral valve. Vegetations on auricular side. Valve incapable of holding water. Lungs: Weight, 2,000 grams. Crepitant in upper part and lateral border. Chest contained 360 c. c. of a clear, straw-colored fluid, principally from the right side. Pitted on pressure near root of middle lobe of right side and upper part of lower lobe on left side. On making section through these areas a bright, sanguineous fluid exuded and covered the surface. Sections very dark and felt sodden. Both lungs much congested. Lower lobe, right side, adherent to diaphragmatic and costal pleuræ, laterally and posteriorly. Liver: Weight, 2,000 grams. Slightly congested. Normal color. Stomach: Distended with gas. Slight congestion of mucous membrane. Spleen: Weight, 590 grams. Abnormal shape. Large sulcus in right border. Vessels entered hilus above the sulcus. Pitted on pressure. Dark and somewhat softened structure. On making section, exuded bright red fluid. Kidneys: Right, weight, 175 grams; left, weight, 190 grams. Dark and congested on section. Capsule easily stripped. Intestines: Distended with gas. No inflammation. Calvarium not removed,

C. H. G.

F. E. W.

CASE 6.

Aortic and mitral.

J. J.; aged 45 years; nativity, Canada; was admitted to the United States Marine Hospital, San Francisco, Cal., December 5, 1898, and died January 28, 1899, at 6 a. m.

History.—Patient had a soft chancre in 1881. He complained of dyspnoea on slight exertion for three weeks prior to admission. Had a cough for one week but no expectoration. Palpitation and precordial pain with fainting attacks occurred at irregular intervals. Patient was a well-developed, well-nourished, medium-sized adult white male. Face slightly flushed. Marked pulsation of the carotids, subclavians, and brachial arteries were visible, and a heaving impulse was seen in the epigastrium and below, and 2 centimeters to the left of the left nipple. Dyspnoea was marked. The pulse beats were 110 per minute, and of Corrigan's water-hammer variety. The lungs were resonant on percussion, and on auscultation a few small bubbling râles were heard. The area of the heart's dullness was extended downward and to the left. On auscultation a murmur replacing the systole and the diastole could be heard at the apex and was transmitted to the axilla. At the tricuspid area a systolic murmur was heard, and the diastole was accentuated. A systolic murmur was heard at the aortic area, and the diastolic sound had a booming quality. Albumen was found in the urine. The patient had frequent attacks of dyspnoea, and was unable to lie down but for a short time at intervals for three days before his death. Edema of lungs developed. On January

28, at 6 a. m., the patient died. The treatment was tincture of digitalis, 0.64 c. c.; Basham's mixture, 10 c. c.; whisky, 50 c. c.; and iodide of potash, 0.3 grams three times daily. Tincture of stropanthus, 0.64 c. c., and strychnine sulphate, 0.002 grams, were also given with aromatic spirits of ammonia, 5 c. c., thrice daily. Atropine sulphate, 0.0005 gram, with morphine sulphate, 0.022 gram, were used at times when absolutely necessary to give rest.

*Necropsy (five and one half hours after death).—*The body is that of a well-developed, well-nourished, white adult male. Rigor mortis is present, and post-mortem lividity is well marked. The subcutaneous areolar tissue is oedematous. The peritoneum is normal and the omentum injected. About 1,000 c. c. of clear yellow fluid is found in the peritoneal cavity. The pericardium contains 30 c. c. of a clear yellow fluid. The heart weighs 680 grams and is much enlarged. All the heart cavities are filled with clotted and fluid blood. The walls of the left ventricle are thickened and show fibroid degeneration. All the other walls are thickened. Pulmonary semilunar valves thickened and calcareous in spots. The aortic semilunar valves are sclerosed, with adherent edges, and masses of fibroid tissue and calcareous degeneration cover the ventricular surface. The auriculo-ventricular openings on both sides are enlarged and the tricuspid and mitral valves are thickened. The coronary valves are normal. The left parietal pleura is injected. A muco-purulent fluid exudes from the left bronchus. The left lung weighs 830 grams, pits on pressure, is very oedematous, and is in the condition of brown induration. The left kidney weighs 210 grams; its capsule is adherent, the cortex occupies one-quarter, and the cut surface is pale, with slight injection of the pyramids. The right kidney is increased in size, weighs 200 grams, and is lobulated. The renal vein is dilated. On section the surface is pale, with injection of the pyramids. The spleen weighs 310 grams. It is lobulated, its capsule is thick and adherent to the stomach. A fibrous nodule about 4 cm. in diameter extends deeply into the pulp. A separate splenulus about 3 by 2 cm. is found near the spleen, and on section resembles a normal spleen. The liver weighs 2,430 grams. It cuts with increased resistance and the cut surface shows light and dark areas about 3 cm. in diameter, which irregularly alternate with one another. The stomach is dilated and the greater curvature reaches to the umbilicus. The pancreas weighs 150 grams and is normal in appearance. The intestines are normal. The pia mater is oedematous. The brain weighs 1,370 grams. The ventricles are filled with a clear yellow fluid. Cystic degenerations are found along the choroid plexus.

L. H. H.

T. B. P.

J. M. G.

CASE 7.

Aortic and mitral.

P. H.; aged 45 years; nativity, Wisconsin; admitted to the United States Marine Hospital, port of San Francisco, Cal., April 22, and died June 23, 1899.

History.—Family history negative. He has had gonorrhea and syphilis and mountain fever. One year ago he began to notice shortness of breath, especially after great exertion. For the last two weeks this symptom had increased, causing him to cease work. When admitted patient complained of pains in pit of stomach, especially on exertion; and in præcordia, extending down both arms to wrists; also of dyspnœa on exertion. Patient was well nourished; mucous membranes slightly anæmic. Pulsation of the arteries visible in the neck and also in the wrists. Apex beat about 3 cm. to left of mammary line. Auscultation at aortic cartilage revealed a low systolic murmur transmitted into carotids and a diastolic murmur of peculiar blowing quality. At the apex was heard a systolic murmur transmitted, feebly, to axilla. The pulse was of the Corrigan type.

April 23.—On percussion, the liver found to be slightly enlarged, but not palpable. Capillary pulse seen in nails.

April 25.—Urine negative.

April 27.—Heart dullness extended from one finger's breadth to the right of mid-sternal line to one finger's breadth outside left mammary line.

April 28.—The pulse was irregular in force and frequency.

May 14.—Patient had an attack of dyspnoea.

May 31.—Patient complained of pain in sternal and interscapular regions. From this time to date of death patient had numerous similar attacks (never more than two in twenty-four hours), characterized by dyspnoea, orthopnoea, dull pain arising in epigastrium and extending to thorax and both arms, and rapid pulse, the seizures ordinarily lasting about one-half hour. During one of them death occurred on June 23. Treatment: Diet carefully regulated; following drugs exhibited: Strophanthus, strychnine, digitalis, whisky, Hoffman's anodyne, nitroglycerine, and morphine.

Necropsy (four hours after death).—Body that of a well-nourished, well-developed, adult, white male. Rigor mortis slight. Post-mortem lividity well marked. There is considerable deposit of abdominal fat. The abdominal cavity contains a small amount of straw-colored, rather turbid fluid. The thoracic and abdominal muscles are well developed and dark red in color. The liver extends 7 cm. below the costal margin in the right mammary line. The right lobe extends about 10 cm. below the ensiform cartilage in the median line. The left lobe extends slightly lower. The pericardial sac is markedly dilated, and there is a considerable deposit of fat on its surface. The right lung is free and somewhat compressed by a clear straw-colored fluid, which measures about 500 c. c. The left lung similarly compressed; fluid measures about 450 c. c. The pericardial sac contains about 40 c. c. of clear straw-colored fluid. On opening the pericardium the heart is seen markedly enlarged. Beneath the visceral pericardium there is a layer of fat, especially over the right ventricle. The right auricle contains a clot, mainly dark red, but partly chicken fat in character. The right ventricle contains a large amount of fluid blood. The left auricle and ventricle contain fluid blood mixed with dark clots. The heart weighs 550 grams. The mitral orifice admits four fingers. The tricuspid orifice admits five fingers. The heart substance is dark in color and somewhat friable. The aortic valve is incompetent by the hydrostatic test. The pulmonary semilunar valves are apparently normal. The tricuspid valve is slightly thickened. The right auriculo-ventricular orifice is markedly dilated (probably relative insufficiency). The mitral valve is slightly thickened and gives slight evidences of calcareous infiltration. The aortic orifice (when laid open) measures 85 cm. in circumference. The segments of aortic semilunar valve are distinctly thickened and are the seat of a slight amount of calcareous deposit. The ascending aorta for a distance of 3 cm. from aortic orifice is slightly dilated and exhibits marked atheromatous changes. The diseased portion surrounds the entire lumen of the aorta, and is distinctly demarcated from the sound vessel beyond. Beyond the arch the aorta is apparently normal. Left lung weighs 460 grams; somewhat compressed, otherwise normal. Right lung weighs 560 grams; resembles the left. The spleen weighs 335 grams; of normal consistence and color; contains a large amount of dark blood. Capsule somewhat thickened. Left kidney weighs 160 grams; unusual deposit of perirenal fat. The kidney is lobulated in form. Several small cysts are observed in the cortex. On section the kidney substance is dark red in color, and a large amount of blood exudes from the cut surface. Capsules not adherent. Relation between cortex and medulla normal. Pelvic fat somewhat increased. Right kidney weighs 150 grams; resembles left in every particular except that it contains cysts. Suprarenal capsules normal. Liver weighs 1,770 grams; external surface of right lobe shows white patches (possibly

old cicatrices). No other macroscopic abnormalities. Brain and membranes normal.

D. M.
W. J. L.
J. M. G.

CASE 8.

Aortic and mitral—Tubercle of lung—Tubercle of peritoneum.

G. B.; aged 52 years; nativity, Ireland; was admitted to the United States Marine Hospital, San Francisco, Cal., October 22, and died December 13, 1898, at 11 p. m.

History.—He was treated in this hospital from July 16 to September 26, 1898, for valvular disease of heart, and was discharged much improved. He returned with the same trouble. Of late he had been gradually growing weaker. He vomited after eating, almost immediately. He complained of a humming noise in his ears which was constantly present, and was very dyspnoic on slight exertion. He was fairly well-developed, but greatly emaciated. The heart was greatly increased in all directions, but principally toward the left and downward. On auscultation a presystolic murmur was heard at the apex and a systolic at the aortic valve area. He had a cough and expectorated a thick, yellow, sticky material. Treatment consisted in the administration of 10 minims of tincture of digitalis three times a day. At intervals, when the heart would become especially weak, strychnine was given. General tonic treatment and a light diet were prescribed.

Necropsy (twenty-six hours after death).—The body is that of a well-developed, poorly nourished, white adult male of medium size. Rigor mortis is present. The abdomen is somewhat distended. The parietal peritoneum was generally smooth, but contained a few small tubercles. The visceral peritoneum is studded with miliary tubercles. The abdominal cavity contains 4,000 c. c. of clear fluid. The omentum is studded with miliary tubercles and is very thin. The pericardium is very much thickened and is adherent to the heart over its entire surface so firmly that it can not be removed without tearing that organ. Their combined weight is 545 grams. The aortic and mitral valves are both incompetent. The tricuspid is thickened, but competent. The heart muscle is infiltrated with fat and is pale and soft. The left pleural cavity is full of clear yellow fluid which wells up on incision through the chest wall. Anteriorly the lungs are adherent to the chest wall. The left lung is much compressed and is noncrepitant. Weight, 360 grams. It has a carnified appearance. The middle lobe of the right lung presents an area of tubercular infiltration. The rest of the lung is crepitant and apparently normal with the exception of a small area of adhesion to the diaphragm. Its weight is 625 grams. The surface of the intestines, liver, kidneys, and spleen, in all portions covered by peritoneum, are studded with miliary tubercles. The mesenteric lymphatic glands are enlarged and hard. The liver is pale in color, cuts rather hard, and weighs 1,055 grams. The kidneys show a granular surface on stripping off the capsule, and both show an excess of fat about their pelves. They weigh 175 grams each. The spleen on section presents no abnormality and weighs 240 grams. The bladder is distended. The dura mater is pale in appearance, but the pia mater is chronically inflamed. The arachnoid is opaque over both hemispheres, and under these areas the brain is oedematous. On incision a clear fluid exudes from the sulci of the brain. The brain weighs 1,380 grams.

T. B. P.
J. M. G.

CASE 9.

Aortic and mitral.—Aortic aneurism.

M. H.; (white), male; aged 50; nativity, New York; admitted to United States Marine Hospital at Detroit, Mich., December 3, 1897; died March 14, 1899.

History.—On admission he complained of feeling sick generally; pain in left side when lying on that side or back. Had been drinking heavily, and suffering from gastritis on that account. Had a marked aortic and mitral murmur, but not much hypertrophy. Urine normal. Treatment was symptomatic.

January 12, 1898.—Patient unable to lie down in comfort; does not sleep well.

February 17, 1898.—Heart's action irregular; vague pains in precordial region.

March 4, 1898.—Pain in left side; pleurisy on left side at base behind.

April 16, 1898.—Urinary examination negative.

July 4, 1898.—Complaining again of inability to lie down comfortably; received nitroglycerin gr. 1-100 t.i.d.; bowels constipated nearly all the time; received daily dose of salts.

August 4, 1898.—Had an acute attack of conjunctivitis lasting two weeks.

August 10, 1898.—Complaining of pain in left side and some difficulty in swallowing solid foods.

September 4, 1898.—Pains have become steadily greater, now radiating to shoulder and down the left arm: requires nightly dose of morphine.

October 12, 1898.—Complaining of cough.

November 18, 1898.—Noticeable prominence of upper end of sternum and of left clavicle; feet slightly swollen: no albumen in urine.

December 21, 1898.—Voice beginning to change and swallowing becoming more difficult; cough and pain worse, requiring larger dose of morphine.

February 14, 1899.—Patient gradually becoming worse, developing the classical symptoms of aneurism of the arch of aorta; feet swollen.

February 20, 1899.—Patient having trouble with respiration; the tumor now is quite large, rising about two inches above left sterno-clavicular articulation; swallowing very difficult, becoming rapidly worse.

March 14, 1899.—Gradually sank into a semicomatose state, dying from exhaustion at 3.30 p. m.

Necropsy (two hours after death).—External appearance. Body somewhat emaciated; no rigor mortis nor lividity. Upper part of sternum and clavicles, especially left, very prominent, both clavicles being disarticulated from sternum. Cranium: Skull cap very thick. Upon removal the membranes were seen to hold considerable fluid. When ruptured about 500 c. c. of dark blood containing numerous clots escaped. The membranes were firmly adherent to each other along the longitudinal sinus, and also adherent to the brain along margins of longitudinal fissure from fissure of Rolando backward. Sinuses contained soft recent blood clots. Vessels of pia mater deeply congested, filled with dark fluid blood which soon clotted when exposed to the air. Puncta vasculosa very plainly seen. Ventricles full of fluid. Brain normal in size and consistence. Thoracic cavity: From every incision into the skin and subcutaneous tissues, there constantly exuded a clear fluid. On the inner surface of the upper end of sternum was a depression $3\frac{1}{2}$ cm. in length, 2 cm. in width, and nearly penetrating the bone, caused by absorption from pressure of the aneurism. Both clavicles disarticulated from sternum and a large portion of posterior surface of left clavicle absorbed from the pressure. Right pleura showed a number of very firm bands of adhesions, especially at apex. It contained about 300 c. c. of light yellowish fluid which coagulated upon removal. Left pleura was entirely obliterated by recent easily broken adhesions. No fluid present. Both lungs were small and very deeply congested. Small tubercular deposits were present at right apex, also at

left apex, but in smaller amount. Bronchi and trachea contained a yellowish, thick, muco-purulent fluid. Pericardium contained about 200 c. c. of clear, coagulable fluid. No roughening or adhesions. Heart: Left ventricle slightly hypertrophied. Right side normal. Aortic valve allowed a small amount of blood to regurgitate. Mitral valve was markedly insufficient. Both these valves showed some calcareous deposits. Other valves normal. Heart muscle apparently healthy. Beginning almost at aortic valves, the entire aortic arch consisted of one large fusiform aneurysm, compressing both lungs, trachea, and œsophagus. Although much smaller than during life of patient, it still measured from 7 to 10 cm. in diameter. It terminated abruptly at the commencement of thoracic aorta. At the upper end it contained a large ante-mortem blood clot. The aneurysm was filled with very dark fluid blood, which readily coagulated. The arteria, innominate, carotid, and subclavian arteries were dilated for a short distance from their origins. The wall of the aneurysm was thick and too firmly adherent to surrounding tissues to be dissected out. Abdominal cavity: All organs congested. Liver small, but apparently normal. Gall bladder and ducts normal and nearly empty. Stomach, duodenum, and intestines normal but filled with gas, and contained a very small amount of fecal matter. Omentum contained small amount of fat. Kidneys apparently normal, except very deeply congested. Ureters and bladder normal and empty. Spleen, pancreas, suprarenal capsules, solar plexus, mesentery, rectum, appendix vermiformis, and abdominal vessels normal. Generative organs normal. Left arm and feet swollen from œdema.

W. W. K.

J. G.

CASE 10.

Mitral regurgitation—Aortic aneurysm—Hodgkin's disease.

M. K.; aged 43 years; nativity, Germany; was admitted to the United States Marine Hospital, San Francisco, Cal., November 15, and died December 16, 1898.

History.—Family history was negative. He had gonorrhea in 1881 and had a chance in 1894 or 1895. His illness dated from about October 1, 1898. During this time had a cough; also severe pain in the abdominal and lumbar regions. He was troubled constantly with headache; was dyspnoic on slight exertion and complained of rapid and steady loss of weight and strength. He had noticed some œdema about the eye at various times. On inspection he appeared a well-developed and well-nourished individual. Pulsation was visible in the carotid arteries. Percussion revealed normal lungs, but the heart area was increased in size, and the apex beat displaced toward the left. On auscultation a murmur could be heard with the first sound of the heart, and the second sound had a sharp, short, high note at the apex. The pulmonary first sound was indistinct, but the second sound was decidedly accentuated. A murmur could be heard with the first sound at the aortic orifice. The confusion of circulatory sounds were so marked that the aneurysm of the aortic arch was not suspected at the first examination, nor was it discovered until a subsequent examination some days later. In the groins on both sides were multiple tumors. Eight months ago one small tumor appeared in the left groin. This kept slowly growing until it reached its present size, 4 cm. long by 2.5 cm. in diameter. After the appearance of this a second tumor appeared in the right groin similar to it. After these the number gradually increased until there were 10 or 12 on each side. On examination a general lymph gland enlargement was apparent. Post cervical and a few anterior cervical glands could be felt about the size of peas. The tumors all presented the same general characteristics—hard, smooth, not painful, and of fairly rapid growth. They were not attached to the skin nor deeper tissues, were freely movable, and circumscribed. They were generally ovoid in shape, their long diameters lying in the same axis as

that of the glands from which they sprung. They were close to each other, but were not matted nor attached, and each tumor seemed entirely independent of the others. December 13 a gland 4 cm. long was removed from the left groin for examination with the microscope. December 16 wound was dressed and found united by first intention. On the same day while at supper the patient suddenly fell over, and died at 5.45 p. m.

Treatment consisted of tincture of digitalis 10 minims thrice daily with Basham's mixture and Fowler's solution of arsenic, but no effect was noted on the glandular enlargement.

Necropsy (eighteen hours after death).—The body is that of a well-developed, well-nourished adult, white male of medium size. Rigor mortis is present. There are no distinguishing marks on the body. The peritoneum is normal. The fat of the omentum is excessive and of a deep chrome yellow color. There are 50 c. c. of clear fluid in the recto-vesical space. The pericardial sack contains much fat on the external surface. Its internal surface is normal. It contains 20 c. c. of clear straw-yellow fluid. The surface of the heart is covered by a layer of thick yellow fat. The heart is collapsed; its walls are generally thickened and show a fatty degeneration, and all its cavities empty. The aortic and mitral valves are both incompetent. The ascending aorta is fatty and dilated. The arch and descending aorta are much dilated and form an aneurismal sac about the size of a small orange, which had ruptured posteriorly into the left pleural cavity, filling it with blood. The left pleural cavity is entirely filled with blood clot of firm consistence. The pleura is much thickened and there are some old pleuritic adhesions present. The left lung is compressed and occupies the posterior central part of the cavity. It feels firm and seems carnified. On section it exudes a bloody fluid and the entire lung is infiltrated with a sero-sanguineous fluid. Its weight is 1,070 grams. The right lung is oedematous but somewhat crepitant. On section it exudes a sanguineous fluid and pits on pressure. The larger bronchioles contain a serous fluid. Weight, 760 grams. The liver is enlarged, is pale in color, and on section shows signs of fatty degeneration; weight, 2,490 grams. The gall bladder is much distended with a normal-looking bile. The fat surrounding both kidneys is excessive and of a chrome-yellow color. Their capsules peel easily. Both are pale in color, the pelves containing a large amount of fat. The left weighs 170 grams and the right 180 grams. The suprarenal bodies are chrome-yellow in color and both have a number of little nodules on their surfaces about the size of a grain of rice. The spleen is enlarged and weighs 550 grams. It feels somewhat firmer than normal. On section it gives the appearance of exuberant granulation tissue, in which the enlarged granulations are divided into small islets by chains of small grayish bodies about the size of a rice grain, which can be squeezed from the spleen tissue proper. The mesenteric glands are enlarged, hard, smooth, circumscribed, and white. The intestines are normal. The membranes of the brain were found adherent to it at the vertex. On opening them a small amount of serous fluid is seen exuding from the sulci. The surface of the brain is congested. On section it is normal. Its weight is 1,470 grams.

H. A. S.
T. B. P.
J. M. G.

PNEUMONIA, LOBAR.

CASE 1.

Cerebral hemorrhage.

J. F.; aged 57 years; nativity, New Brunswick; admitted to United States Marine Hospital, Stapleton, Staten Island, N. Y., September 17, 1892; died May 11, 1899.

History.—September 17, 1892: Patient was discharged from this hospital one week ago; was under treatment for cystitis. He now complains of vertigo, constipation, and unsteadiness in his gait; appetite fair; no bladder symptoms. Yesterday he had a stroke of apoplexy, which came on suddenly and unexpectedly. He was dazed for a time, and afterwards felt numbness in his left hand and left lower extremity. He presents now the characteristic attitude and appearance of a hemiplegic, with the usual concomitant signs and symptoms—inability to move hand freely on left side; left leg drags when he attempts to walk. His features are distorted, being deviated to the right; tongue when protruded goes to the right side slightly; articulation is not clear and seems to be attended with difficulty. Mental acts are slow. There is partial anæsthesia of left side of body. Coordination is impaired, but patient can walk with deliberation and the use of a cane. In frowning, the usual wrinkles do not appear on left side of forehead; left eye closes imperfectly. Hearing on the left side is imperfect; tick of watch heard only 6 inches distant; patella reflexes exaggerated, especially on left side. Pulse 74; temperature 37° C.; respiration 18. Body well nourished; tongue is slightly furred. Chest prominent; supra clavicular regions full. On inspiration whole chest wall seems to move upward; vocal fremitus diminished; percussion note vesiculotympanic. Auscultation, respiratory murmur weakened and broncho-vesicular in character; no râles. Heart sounds seem distant, and there is a systolic murmur at apex. Liver and spleen apparently normal in size. Prescription of sat. sol. Kali iod. 1 c. c. t. i. d. after eating.

September 18.—Prescription of Rochelle salt, 20 grams.

September 20.—Ext. Cascara Sagrada, 5 c. c. These latter and other remedies were repeated during successive days to overcome obstinate constipation. Urinary analysis: Specific gravity 1.018; reaction neutral; color light; albumen absent.

September 21.—Dynamometer, right hand 33 K; left hand 28 K.

September 29.—Dynamometer, right hand 43 K; left hand 38 K. Prescription of ext. convallaria 4 c. c., tr. nux vomica 0.3 t. i. d. Ophthalmoscopic examination: Left eye, retina and disk apparently normal; right eye, disk not discernible. Patient's condition remains practically unchanged up to February, 1893. Examination of eyes: Right edge of disk indistinct and congested; center about normal in color and appears to be depressed, probably because of the raised and congested border; arteria centralis retinæ appears to approach from the center of disk, i. e., it stands out prominently. Prescription of sat. sol. kali iod. 1 c. c., t. i. d., resumed after having been discontinued for a time. Dynamometer, right hand 39.50 K; left 34 K.

March 7, 1893.—Dynamometer, right hand 37 K; left 29.

March 20.—Dynamometer, right hand 35 K; left 35.

April 4, 1893.—Elixir phosphate of iron, quinine, and stychuine, 5 c. c., t. i. d., before meals.

June 3, 1893.—Tr. digitalis 0.6 c. c., t. i. d.

July 4, 1893.—Stop all medication.

August 3.—Start elixir three phosphates same as before.

August 26.—Feeling "quite well," stop medicines again.

September 27.—Head feels badly.

October 1.—Patient to go to dining room for his meals.

October 15.—Constipated; prescription of 3 compound cathartic pills. Laxative required at intervals of a few days during subsequent month.

November 22.—Sat. solution Kali iod. 1 c. c., t. i. d.

January 1, 1894.—Elixir three phosphates added to the above; latter is continued for three weeks.

January 20.—Spt. frumenti 20 c. c., tr. digitalis 0.3, t. i. d.

January 27.—Much better.

February 28.—Stop medication.

July 25.—Shows little change during past five months. Has cephalagia. Prescription of acetanilid 0.15 gram, camphor monobromated 0.15 gram, caffeine 0.1 gram, t. i. d.

July 30.—Head clearer.

August 7.—Stop last medicine.

August 15.—Compound jalap powder 0.6 at night.

August 22.—Feels much better. Prescription of sol. potass. arsenitis 0.3 in water after meals.

September 2.—Complains of vertigo; medication stopped.

October 1.—Legs about the same: lumbar pains and stiffness. Prescription of lithium carbonate 0.3 grams, t. i. d.

October 22.—Improved. Examination of eyes: Vessels are indistinct; vision poor; reflexes remain exaggerated. Patient has difficult locomotion still.

During next year patient's condition remains practically unchanged. Treatment symptomatic; laxative and stomachics, with exception of occasional courses of binioidide of mercury and iodide of potash.

October 1895.—Following notes on history: Intellect below par; no particular trouble with pupil reflex; patellar reflex slightly exaggerated; slight ankle clonus; coordinates fairly well in walking, but gait indicates motor weakness; grip of hand as indicated by dynamometer, 25 K for right, 23 for left.

March 1, 1896.—Constipation is obstinate. Prescription of liq. potass. arsen, 5; strichnia sulph, 0.03; tr. belladonna, 6; tr. Cardamon Co., 50; aquæ destillatæ q. s. ad to 100. Misc. sig., 4 c. c. t. i. d., after meals.

May 1, 1896.—Patient has been having regular intestinal movements since taking the above.

January 1, 1897.—Systolic murmur present at apex of heart for a time has disappeared.

July 1897.—Urination frequent; quantity voided each time is slight.

February, 1898.—Pills of aloin, belladonna, and strychnine. One after meals is necessary to induce intestinal movements. Galvanism is applied to extremities, primary current, for five minutes daily.

March 1, 1898.—Present condition of patient: Well nourished; has good color; muscles fairly developed; has good appetite; rests well at night with the exception of having to get up two or three times to void urine: bowels constipated (this has been a persistent symptom through his entire clinical history). Has attacks of vertigo, but these are less severe than formerly. Locomotion very difficult; patient takes short steps and loses equilibrium when he attempts to walk with eyes closed. Knee jerk exaggerated; has no headache; no pain in back: is comfortable while at rest, but simple turning of the head causes dizziness; pupils equal and and respond to light fairly well. Treatment at present, tincture nux vomica 1. c. c., t. i. d., and aloin, belladonna, and strychnia pill at night. Electricity applied daily at present.

May 1, 1898.—Spt. glonoin 0.001 gram, t. i. d.

May 15.—Patient feels much better; his vertigo has disappeared.

May 20.—Gradual improvement.

May 30.—Condition remains stationary now.

June 4, 1898.—Upon attempting to stand up this morning patient lost his balance and fell back into his chair; thinks he is getting weaker: patellar reflex greatly exaggerated; pupillary reflex to light, fair.

June 12.—Walks with legs wide apart, but in a straight line and without staggering, but on attempting to turn around suddenly he falls unless there is some object to grasp.

June 16.—Nitroglycerin, which relieved his vertigo so effectually and "made him feel good," now seems to induce the symptom, and with it "weakness."

June 19.—Patient has vertigo, but not so marked as prior to course of nitro-glycerin.

June 23.—Says he is getting weaker all the time. Prescription of elixir three phosphates 5 c. c. three times a day.

August 3, 1898.—Patient is feeling badly; dizzy and staggers when walking more than ever before; falls down when he turns his head. Prescription of sat. solution potass. iodide 1 c. c., t. i. d., increased a drop daily to 2 c. c. t. i. d.

August 21.—Dizziness the same; knee jerk exaggerated; tonic of iron, quinine, and strychnia fails to benefit patient now as it did a year ago.

September, 1898.—Incontinence of urine after morning and evening meals (takes as beverages coffee and water). Vertigo persists.

October 2, 1898.—Right foot and leg are greatly swollen and oedematous; left is affected to lesser degree in same manner. Incontinence of urine at night. Prescription of atropia sulph. 0.001 gram.

October 15, 1898.—Albuminuria. Specific gravity of urine, 1.025; reaction acid.

November, 1898.—Edema of extremities disappears after rest in bed, combined with tonics and stimulants.

December, 1898.—Catheterization twice daily.

December 13.—Has some sensation previous to and during micturition, but power over act has not returned.

December 18.—Patient fell to floor in prone position, striking his head on angular object and inflicting a scalp wound 2 cm. long; was not aware of injury.

December 22.—Wound united under antiseptic dressing; no pain was occasioned; rest in bed enjoined.

December 26.—Patient apathetic; is suffering from decubitus and is practically helpless. Constant dribbling of urine, necessitating frequent change of bed linen; has to be helped to and from bed. Bladder is being irrigated with warm boric-acid solution twice daily; internally tincture chlorid of iron 0.620 is given t. i. d.

December 28.—Bed sores improving under dry dressing. One is located on each buttock.

January 11, 1899.—Each alternate night patient vomits about 12 o'clock. Prescription of lime water and milk equal parts 200 c. c.

January 19.—Urine is turbid and alkaline; specific gravity, 1.015. Constant use of bed urinal is necessary, and this has led to erosion of penis and scrotum.

March, 1899.—Patient hobbles along with much difficulty by means of a stick; falls on attempting to turn unless he grasps some object. Features remain distorted to right side and articulation is not clear. Mental acts very slow; incontinence of urine continues; motion of left leg and arm are much impaired; sensibility likewise impaired. Pulse 64; respiration 20; temperature normal. Reflexes continue much exaggerated. Atrophy of muscles on entire left side of body, including face and extremities.

April 20.—Patient eats well and sleeps well, but sees poorly. Prescription of ammonium benzoate, 0.3 grams, t. i. d., in hope of improving condition of urinary apparatus. Analysis of urine shows specific gravity of 1.030, alkaline reaction, chalky sediment, no albumen, no sugar.

May 4.—Patient remains in bed to-day for first time in weeks; face is flushed; temperature 40 C.; pulse 100. Twitching of muscles of face and extremities; tongue furred. Physical examination of chest shows a decrease of respiratory sounds and slight dullness at right base; heart sounds distant and feeble, heard best at left of sternum, sixth intercostal space; respiratory murmur feeble over left lung, but no dullness elicited by percussion; crepitant rales heard over right base posteriorly in considerable area. dullness quite extensive here.

May 5.—Patient much prostrated; no control of bowels or bladder: suspicious flush over nose and cheeks, almost erysipelatous in character. Prescription of

ointment of ichthyol 10 per cent locally. ammonium carbonate 0.6 gram. spirits frumenti 20 c. c. every four hours. Cerebral vomiting (projectile character).

May 6.—Mental acts sluggish, tongue protruded with difficulty; articulation almost impossible. Pulse 112; temperature 39° C.

May 7.—Face pale, but there has developed a purulent conjunctivitis. Prescription: Frequent instillations and local cleansing with hot saturated solution boric acid. Physical examination: Marked dullness at base left lung; murmur muffled and feeble but no rales heard. Dullness over right has extended to involve middle lobe. Temperature 38° C.; pulse 112.

May 8.—Temperature 39° C.; pulse 112 and intermittent, but no murmur audible over heart; no response to questions; incontinence for past five days; perspires profusely.

May 9.—Stupidity more pronounced; rales subcrepitant, heard over right lung; respirations superficial and rapid—30 per minute. Treatment: Ammonium carbonate 1 gram, spirit frumenti 20 c. c., strychnia sulph. 0.002 every four hours.

May 10.—Great dyspnoea and dysphagia, profuse perspiration; incontinence. Stupor continues; temperature normal; pulse 120 and very feeble; purulent conjunctivitis has improved.

May 11, 10 a. m.—Unconscious; throat gurgle of death; pulse almost imperceptible; temperature 40° C.; respiration 46; moribund. Expired at 2 p. m.

Necropsy (twenty-two hours after death).—Body well developed; poorly nourished; post-mortem rigidity marked; post-mortem staining in dependent portions of body. Subcutaneous fat over abdomen excessive in amount as revealed by median incision. Adhesions to sternum in anterior mediastinum; pleuritic fluid absent; pericardium thick and tough; pericardial fluid normal in amount. Heart soft, small, and flabby. Dark semicoagulated blood escapes on section of larger vessels. Heart weighs 370 grams. Lungs: Right lung weighs 640 grams; left 410 grams. Firm fibrinous clot in right side of heart; valves competent; slight evidence of atheroma at attached border of aortic valve; a few atheromatous spots on endocardium near attached border of mitral valve. Left lung crepitant in upper lobe; base oedematous and congested; does not float. Right lung congested throughout; lower and middle lobes attached by recent adhesions; zone of gray hepatization; section sinks (lower lobe). Abdominal viscera normal in position; omentum fatty. Left kidney weighs 140 grams; right 180 grams. Capsule of left kidney adherent; surface granular; cortical portion shows fatty streaks. Right kidney decidedly granular; capsule nonadherent, somewhat fatty; cortical portion narrow. Spleen of normal size, pale, and weighs 200 grams. Liver weighs 1,300 grams; left lobe very minute, weight 95 grams. Surface of organ mottled. Section followed by escape of blood from large veins at longitudinal fissure; surface granular, nutmeg; resistant to knife. Gall bladder distended with bile; duct patent. Urinary bladder filled with urine. Stomach and intestines normal. Appendix dark at free end; adherent and contains fluid; no stenosis. Pancreas weighs 140 grams; no lesions. Brain: Dura firmly adherent to skull; vessels on right side of brain prominent. On upper margin of right temporal lobe is seen a bright red area about 2 cm. square. A depression just below this point; considerable amount of fluid escaping from brain. Corresponding red zone on left side of brain. Excessive amount of cerebro-spinal fluid escaping from spinal canal; brain bathed in fresh serum weighs 1,390 grams. Fluid escapes from ventricles in large amount. Fifth ventricle enlarged and dilated. Dura attached by adhesions along superior longitudinal fissure. Lateral ventricles dilated and filled with fluid. Interior of organ pale. In right motor cortical area, involving the posterior part of lenticular nucleus and the caudate nucleus, and between the corpus striatum and internal capsule is an area about 0.5 cm. square, presenting a granular appearance and differing conspicuously from corresponding zone in opposite side of brain. Herein are contained numerous punctiform areas, white and contrasting

with the gray background. These evidently represent new-formed fibrous tissue, which has replaced a former extravasation; reconstructive change. No softening of brain anywhere. Cause of death, lobar pneumonia and oedema of the brain.

F. J. T.

G. W. S.

CASE 2.

J. M.: aged 49 years; nativity, England; admitted to the United States Marine Hospital, Cleveland, Ohio, February 15; died February 21, 1899.

History.—The patient was admitted complaining of a severe cough and pains all over the body. He stated that he had enteric fever twenty years ago; fractured wrist eight years ago; previous history otherwise negative. Five days before entering the hospital the patient had a chilly sensation, but not a decided chill. He also complained of severe headache, pain in the neck on motion, and soreness in the chest from coughing. He had been troubled with diarrhea several days before admission, but his bowels are now in their normal condition. At the time of admission the patient's temperature was 36.3° C., respiration 27, and pulse 120 and very weak. The temperature subsequently ran up to 40° C. There was marked dullness over the entire right lung, increased vocal fremitus and bronchial breathing. Heart rapid and very weak. The patient failed to respond to stimulants and died February 21, 1899.

Necropsy (seven hours after death).—Lividity slight; rigor mortis marked; general nourishment poor. The pericardial sac contained 60 c. c. of serum. The heart weighed 290 grams; ventricles hypertrophied; mitral valves thickened and incompetent; the right ventricle contained an ante-mortem clot. The left pleural cavity was adherent anteriorly. The left lung weighed 410 grams; was quite oedematous, with marked hypostatic congestion in the lower lobe. The right pleural cavity was adherent throughout. The right lung weighed 1,387 grams. The entire lung was in the stage of gray hepatization; the organ was yellowish gray in color, very soft in consistency, and on pressure there was an abundant oozing of the emulsified inflammatory exudate, which was most abundant in the upper lobe. The peritoneum was normal. The stomach was greatly distended and contained 1,250 c. c. of fluid mixed with mucus; there was a slight congestion at the pyloric end. The small intestine was congested. The liver weighed 1,732 grams, was yellow in color, and presented marked evidence of fatty changes. The gall bladder was small in size and contained 10 c. c. of ropy muco bile. The pancreas weighed 97 grams. The left kidney weighed 144 grams; the right weighed 134 grams; both kidneys were normal. The ureters, bladder, urethra, and prostate were normal. The spleen weighed 146 grams; very pale; trabecula prominent. The brain and its membranes were normal; weight of brain 1,435 grams.

H. W. W.

CASE 3.

E. C. R.; aged 23 years; nativity, Illinois; was admitted to the United States Marine Hospital, San Francisco, Cal., March 16, and died March 23, 1899.

History.—Family history negative. He had gonorrhea one and one-half years ago and malaria six months ago. He had been ill three days before entering hospital. After exposure to bad weather he was seized with a chill, succeeded by two more chills and considerable fever. Then a cough developed, which caused considerable discomfort. At first it was dry, but within a few hours was accompanied with thick, sticky sputum. The sputum later assumed a dark color and became streaked with bright blood. Severe cutting pain developed in the right side and he became dyspnoic. Complained greatly of dry, pasty condition of the mouth and great thirst. He was very weak and felt nauseated. The tongue was coated with brown fur. He was well developed and well nourished. The heart area

bronchial breathing was heard over the area and a distinct friction sound could be heard. Percussion caused great pain. The respirations were 30, the pulse 100, and the temperature 39° C. The patient did not do well from time of admission and the pneumonia progressed, involving the entire right lung and then the left lung in its entirety. Death occurred March 23, 1899. Treatment: A cotton jacket was applied; quinine given to reduce the fever and whisky given as a heart stimulant. Codeine and Magendie's solution were both given at different times for the pain. Later strychnine and carbonate of ammonia were given in addition to the whisky. A mouth wash of listerine was also prescribed, with as much fluid food as the patient could be induced to take.

Necropsy (six hours after death).—The body is that of a well-developed, well-nourished adult white male, of medium size. No external marks of note are seen. The peritoneum is normal. The intestines are somewhat injected and distended. The liver projects one finger's breadth below the margin of the ribs. The lungs fill up the entire pleural spaces, and are firmly attached to the walls of the thorax by recent deposits of fibrin. They are both found indented by the ribs. The left lung weighs 890 grams. Its anterior edge is crepitant, but the posterior part is hard. On section the posterior portions of both lobes are found in the state of red hepatization of pneumonia. The right lung weighs 1,140 grams. Its superior and about half of the middle lobe are in the state of red hepatization. The inferior lobe is in the state of gray hepatization. The bronchi of both lungs are congested and exude a muco-purulent secretion on section. The consolidated portions of the lung sink in water. The pericardium is normal. It contains 60 c. c. of clear fluid. The heart is distended, and the veins on its surface are congested. There is a slight excess of fat on its outer surface. All the cavities are full of clotted blood, the left auricle containing, in addition, a white clot. The valves are all competent. The left side is hypertrophied, but the muscle is firm and in good condition. There are evidences of beginning fatty degeneration in the ascending portion of the aorta. The left kidney weighs 185 grams, and the right 195 grams. Both have slightly thickened cortices, but are otherwise normal. The surface of the brain is slightly congested. It is otherwise normal and weighs 1,385 grams.

T. B. P.

J. M. G.

CASE 4.

W. M. (colored); aged 41 years; nativity, Kentucky; admitted to the United States Marine Hospital at St. Louis, Mo., January 14, 1899, and died January 16, 1899.

History.—Patient had been sick three days. His illness began with a chill after being overheated and then suddenly exposed to cold while acting as fireman on one of the river boats. He has severe pain in his left side, and his expectoration is of a rusty color. His harsh breathing can be heard some distance from his bed. Physical examination of the right lung shows slight dullness on percussion over the whole lung, but more marked at base; respiratory sounds exaggerated; vocal fremitus and resonance increased over that of the other lung; over the left lung there is marked dullness at base; the respiratory sounds are very much roughened, and numerous râles are heard over the whole surface; pulse, 104; temperature, 40° C., and respirations, 44. During the next day his pulse ran up to 156, his respirations to 56, and his temperature remained at 40° C., except when it was lowered temporarily by ice packs. His respirations became more and more embarrassed, and he died at 11 a. m. on the morning of January 16, 1899.

Necropsy (twenty-seven hours after death).—Body of a muscular man well developed; height, 173 cm.; rigor mortis well marked. Scalp loose; frontal bone, 1.1 cm. thick; occipital bone, 1.3 cm. thick. Sinuses of the dura mater filled with

blood. Weight of brain 1,430 grams; its measurements are 18 by 17 by 10 cm. Abdominal walls thick, tense, and muscular, moderate amount of deep yellow subcutaneous fat; intestines of a gray color and distended with gas. Upon removing the sternum the pleura is found to be slightly adherent to the left lung throughout, especially to its lower lobe and the inferior half of its upper lobe; 50 c. c. of fluid contained in pericardial sac. Heart: Weight 480 grams, 15 by 8 by 6 cm.; wall of right ventricle 1 cm. thick; left ventricle 1.75 cm. thick; valves normal. Right lung: Weight 752 grams, 22 by 22 by 13 cm.; color dark blue, with patches of pale pink. On section a reddish fluid exudes. The lung was crepitant in some places, but in the pink patches mentioned above the tissue was hard and resistant to the knife. Left lung: Weight 1,406 grams, 27 by 18 by 11 cm.; color dark red, nearly black at base; tissue hard, heavy, and noncrepitant; gray purulent matter exuding from all parts of the lung on section. Spleen: Weight 250 grams, 13 by 9½ by 4 cm.; slate color externally, internally brownish red color. Left kidney: Weight 200 grams, 12½ by 8 by 4 cm.; capsule peels off easily; cortical substance, 0.75 cm. in thickness. Right kidney: Weight 230 grams, 13½ by 8 by 4½ cm.; tissue normal. Liver: Weight 2,170 grams, 26½ by 19½ by 10 cm.; tissue on section brownish red color.

H. S. F.

W. G. S.

CASE 5.

J. Y.: aged 33 years; nativity, Ireland; admitted to the United States Marine Hospital, Cleveland, Ohio, December 26, 1898, with diagnosis of lobar pneumonia; died January 1, 1899.

History.—The patient stated that he had not been well for six days before entering the hospital. He had two chills, one four and the other two days before admission; was also troubled with anorexia and constipation. At the time of admission he had a temperature of 40.2° C., pulse 120, respiration 25, severe pain between the shoulders, posteriorly, and in the left supra spinous fossa: pain aggravated by coughing; also complained of pain in epigastric region. Sputum was rusty and tenacious. Examination showed a flushed face, slight dilatation of pupils; tongue covered with a brown fur; respirations shallow and rapid; heart rapid; valves all competent; accentuation of the second sound at pulmonary area; pulse of good volume. There was marked dullness over lower lobe of left lung; increased fremitus and resonance; bronchial breathing and a great many moist râles generally diffused over chest posteriorly.

December 28.—Patient quite comfortable; expectoration very free and rusty; coughed a great deal; respiration, 34; pulse, 118; temperature, 40° C.; physical signs unchanged; was slightly delirious during the night.

December 29.—Quite delirious last night; complained of pain in left mammary region and difficulty in raising sputum; respiration, 34; pulse, 120; temperature, 39.4° C.

December 30.—Patient feeling better; temperature normal; physical signs unchanged.

December 31.—Pulse rapid; rise of temperature to 39° C.; beginning involvement of lower lobe of right lung. About 3 p. m. patient changed for the worse; he was unable to expectorate, and the sputum collected in the air passages; pulse much weaker.

January 1.—Delirious during the night; pulse very feeble; unable to expectorate, and died at 8 a. m.

Necropsy (twenty-four hours after death).—Lividity marked in the dependent portions; nourishment good; rigor mortis present; pupils dilated. The pericardial sac was normal. The heart weighed 295 grams; valves all competent. Left ventricle contained a dark purple clot; right ventricle contained an antemortem clot;

The larynx and trachea contained a considerable quantity of mucus. Left pleural cavity obliterated by adhesions. Left lung weighed 1,650 grams; lower lobe was in the stage of red hepatization; reddish brown in color; sunk when put in water, entire absence of crepitation. On section was dry, rough, and granular. The upper lobe was much congested. The right pleural cavity contained adhesions posteriorly. The right lung weighed 810 grams. The lower lobe was in the stage of engorgement. Crepitation was present, but in a less degree than normal. On section there was an abundant oozing of bloody serum. There was a small calcified body about the size of a cherry stone found embedded in the substance of the lower lobe. The upper lobe was somewhat engorged and on section showed a frothy exudate. The peritoneum presented no pathological changes. The stomach and intestines were normal. The liver weighed 2,540 grams, and was congested. Gall bladder contained 50 c. c. of bile; duct normal. Pancreas weighed about 100 grams. The left kidney weighed 240 grams; the right 225 grams; both kidneys were normal. The ureters, bladder, urethra, and prostate were normal. The spleen weighed 150 grams. The brain and its membranes were normal; weight of brain, 1,450 grams. Microscopic examination of lung: Stained with hæmatoxylin and eosin; showed gray and red hepatization in different areas. Alveoli filled with polymorphous nuclear leucocytes, small round cells, and epithelium from alveolar walls. Bronchioles filled with granular-looking material and epithelial casts; also leucocytes.

H. W. W.

CASE 6.

Pleurisy, acute.

H. O.: aged 28 years; nativity, Norway; admitted to the United States Marine Hospital, port of New York, N. Y., September 6, 1898; died September 13, 1898.

History.—On admission patient complained of a cough and of pain in left side of chest, especially when a full inspiration was taken. There were signs of pleurisy (acute) at the base of the left lung. After two days in the hospital his condition improved greatly, his temperature becoming normal. His respiratory rate was but little accelerated till the third day, when within an hour the rate was doubled, his temperature rising. The sputum at this time was blood tinged, but not yet typical of pneumonia. In fact the patient coughed but little and expectorated less, swallowing this. With this change signs of pneumonia began to develop in the lower lobe of the left lung. The right lung became affected the next day. There were numerous râles at first over both lungs, but as the respiration became more and more bronchial they disappeared. His breathing was decidedly bronchial the last two days. The respiratory rate was very rapid (50 to 60 per minute). His pulse was quite strong till the day before his death, when it was very weak—extremely weak and rapid the last day. Notwithstanding stimulative treatment the patient's condition became worse, and he died at 6.25 p. m. September 13, 1898. The patient had some intestinal disturbance, but this was greatly masked by the other conditions.

Necropsy (seventeen hours after death).—Man apparently about 30 years of age. Rigor mortis well marked. On entering the abdominal cavity the small intestines are seen to be congested and distended with gas. Position of abdominal viscera normal, as is the insertion of the diaphragm. On opening the thorax the pleura of the lower lobe of the left lung is seen to be adherent to that of the chest wall. When torn away a fibrinous deposit is seen on each. This is also true of the middle lobe of the right lung. There is 75 c. c. of fluid in the left pleural cavity and 125 c. c. in the right. The lower lobe of the left lung and the middle lobe of the right lung are very red externally. The lower lobe of the right lung shows a reddish mottling. The lower lobe of the left lung is, to the touch, hard and non-

crepitant. It is cut with difficulty. On section it is very red, being in the stage of red hepatization. The upper lobe is of normal appearance and consistence externally and on section. The left lung weighs 1,130 grams. It does not float. The middle lobe of the right lung is red externally and on section, and is non-crepitant. The lower lobe is, to the touch, firm and but slightly crepitant, being in the stage of engorgement. The upper lobe is of normal appearance. It is crepitant. Upon incising the pericardium 400 c. c. of serum exudes. The heart is covered with a fringe-like fibrinous growth, as is the inside of the pericardiac sac. There is very little blood in the heart. A clot weighing 25 grams is found in the right auricle and a piece of chicken-fat like material in the left ventricle. The valves seem competent. The heart weighs 380 grams. The intestines are somewhat inflamed, having a reddish-pink color externally. Internally the membrane has a catarrhal appearance, but there is no ulceration. Peyer's patches are not especially inflamed. The spleen weighs 290 grams. It is not especially enlarged and on section its tissues appear normal. Both kidneys are quite large, the right weighing 280 and the left 340 grams. To all appearances, however, externally and on section they are normal. The liver weighs 2,200 grams. It is a light-brown color and is of normal consistence to the touch and on section.

R. C. C.
G. W. S.

CASE 7.

Pericarditis—Meningitis.

F. P.; aged 35 years; nativity. Cape Verde Islands; was admitted to the United States Marine Hospital, San Francisco, Cal., on November 23, 1898, and died immediately thereafter.

History.—On entering, the patient was moribund. The pulse was rapid, weak, thready, and wiry. The respiration was noted to be rapid, and large, bubbling, laryngeal râles could be plainly heard. He was at once placed in bed, where he died immediately. The only history obtainable was from a friend, who said patient had been sick seven or eight days in a boarding house; that he had fever and had been spitting and vomiting blood during this time, and that blood had been discharged per anum. Stimulants and external heat were applied, but had no effect.

Necropsy (seventeen hours after death).—Body that of a well-developed, well-nourished mulatto adult male of medium size. Rigor mortis present. On the left forearm are the initials F. J. P., in red tattooing. Livores mortis are to be seen in the region of the flanks, the spots varying in diameter from 8 to 10 cm., and being irregular in outline. Three cicatrices are on the inner side of the left knee, round in shape and 1 cm. in diameter. There are also three cicatrices in left groin about the same size, which are depressed, and around which is an area of pigmentation. One, similar, is over the anterior surface of the left tibia. On incision the panniculus adiposus is rather poorly developed. The peritoneum is shining and to all appearances normal. Diaphragm is attached anteriorly on a level with the fifth costal cartilage. The great omentum is almost devoid of fat. There are about 5 c. c. of clear, straw-yellow fluid in the recto-vesical space. The pericardium is somewhat distended and opaque. The outer side is a little injected; contains 40 c. c. of a clear, straw-yellow fluid, suspended in which are numerous fibrin flakes, and at the bottom of which is a mass of coagulated fibrin 2.5 cm. long and 1 cm. thick. The parietal pericardium is normal generally, but with a few areas covered with coagulated fibrin and somewhat thickened. One large fibrinous mass is on its anterior surface. The visceral surface is generally glittering but contains a few of these fibrinous patches. The heart muscle is firm and cuts with normal resistance. The right auricle is filled with coagulated blood. The right

ventricle is full of fluid blood, and its walls are very slightly thickened. The left ventricle is empty and its wall is decidedly hypertrophied. The left auricle contains clotted blood, and a large ante-mortem clot. The aorta and pulmonary arteries contain white post-mortem clots which are easily detached and are quite elastic. The aortic semilunar valves are incompetent by the hydrostatic test and are a little sclerosed and thickened. The mitral valve is incompetent and the left segment is decidedly retracted. The tricuspid valve is normal as are also the pulmonary semilunar valves. The heart weighs 420 grams. The right lung adheres to the chest wall very firmly throughout, the plural cavity being obliterated. It is also adherent to the diaphragm and separates with considerable difficulty. The pleural surface of lung is thickened, opaque, and covered with firm, fibrous masses. Its weight is 930 grams. The right lung crepitates over its superior and middle lobes and a portion of the inferior lobe. The lower part of the inferior lobe is consolidated and has a doughy feeling. On section it is red, carnified, and exudes a reddish-brown fluid. In its center is an abscess cavity about the size of a walnut, filled with a thick, yellow pus. The left lung is adherent over its entire surface, and on removal a large, thick clot of fibrin is found covering its apex. The entire plura is thickened and covered with fibrin. Its weight is 2,630 grams. The inferior lobe of the left lung and a small portion of the superior lobe are in the stage of red hepatization. The cut surface is red and carnified and exudes a reddish-brown fluid, streaked with yellow pus. Crepitation is absent and the tissue has a doughy feeling. The superior lobe is in the stage of gray hepatization, and on section exudes a dirty, yellow, viscid fluid, with a slightly foul odor. A very small portion of the superior lobe is crepitant near the apex. There is none of the exudation to be found in the bronchi, but it completely fills the alveoli of the lung.

The liver is enlarged, presenting on the upper surface of the right lobe an area 8 by 3 cm. light in color. On examination this is found to be calcareous but superficial. Weight 2,445 grams. On section, its resistance is found to be normal, its surface is rather pale, and near the surface of the right lobe is found a light yellowish area 5 by 2 cm., but presenting no contraction. It is irregular in shape. Similar smaller areas are found in various places in the liver. The spleen weighs 119 grams and is to all appearances normal. The adrenals are normal in position and appearance, and weigh 15 grams each. Both kidneys normal. Their fatty capsules are well developed and their capsules peel easily. The left kidney weighs 205 grams; the right, 225 grams. The stomach is normal in appearance and contains 200 c. c. of turbid fluid and partially digested food. Its inner surface presents evidence of chronic inflammation. The small and large intestines are distended with gas, but without evidence of disease. The mesenteric lymphatic glands are, however, enlarged. The rectum and sigmoid flexure are normal. The bladder on its outer surface is normal in appearance. On being opened, it is found to contain 150 c. c. of clear urine. There is a diverticulum on its internal, inferior surface, which will admit the index finger, and contains 50 c. c. of fluid. The calvarium being removed, the coverings of the brain are found to be deeply injected. The larger veins are filled with clotted blood over the entire surface. On opening the membranous covering, about 20 c. c. of clear fluid was obtained and the finer venules of the pia mater found to be injected, and this membrane, in general, presented a reddish appearance. On section, the brain substance is normal in appearance. Brain weight, 1,485 grams.

T. B. P.

J. M. G.

CASE 8.

C. H.; aged, 48 years; nativity. France; was admitted to the United States marine hospital, San Francisco, Cal., January 5, and died January 9, 1899, at 10.45 a. m.

History.—He had a "fever" (kind unknown) in 1881, and gonorrhea ten years ago. His present illness commenced January 1, 1899, with a severe cold. This began with a severe chill followed by fever. Had cough incessantly with which he raised large quantities of sputum, which he said had been, at times, blood-stained, but for the last two days no blood had been expectorated. The sputum at the time of admission was of a yellow color and quite thick. He complained of pain in the lumbar region and over the areas of the lower lobes of both lungs, which was intensified by deep inspiration. The patient was quite cyanotic and dyspnoeic, the respiration being 48 to the minute. The pulse was 115 to the minute. He was well developed and well nourished. On percussion there was dullness of the entire inferior lobe of the right and of the posterior portion of the inferior lobe of the left lung in the back. Auscultation revealed a loud friction sound on the right side and many large bubbling râles over the entire area of that lung. Large râles could also be heard over the inferior lobe of the left lung anteriorly, mingled with bronchial breathing. On palpation, a friction fremitus could be felt over the inferior lobe of the right lung. January 8 dyspnoea came on during the night and grew worse, until the patient was unable to breathe lying down. While propped up in bed death came suddenly at 10.45 a. m. next day.

Treatment consisted in the administration of quinine in full doses, with ammonium carbonate every three hours and liberal stimulation with whisky. The chest was enveloped in cotton jacket and occasional hypodermics of morphine sulphate given to control pain. The citrate of potash cough mixture was administered to relieve painful coughing.

Necropsy (four hours after death).—The body is that of a well-developed, well-nourished white adult male of medium size. There is no distinguishing mark on the body. Rigor mortis is present, and there is a slight amount of post-mortem lividity. The peritoneum is normal. The intestines are slightly distended with gas, and the stomach is much dilated. The exterior of the pericardium is covered with a thick layer of yellow fat. The internal surface of the pericardium is slightly injected, but its surface is smooth, and there are no adhesions present. It contains 60 c. c. of clear, straw-yellow fluid. The walls of both ventricles of the heart are considerably thickened and covered with an excessive amount of yellow fat. The coronary veins are full. The left and right auricles are both full of dark semifluid blood. The left ventricle is firmly contracted and contains a small amount of dark semiclotting blood, and a white fibrinous clot not adherent to the heart wall. The right ventricle is partially filled with clotted blood. The valves of the heart are all competent and normal. The aorta is slightly sclerotic in its ascending portion. The left pleural cavity contains 500 c. c. of clear fluid. The right lung is attached to the chest wall by numerous adhesions. Both lungs are collapsed, and occupy about one-half of their respective cavities. The lungs both present a carnified appearance, and neither is crepitant. Both pit on pressure and have a "boggy" feeling. On section the bronchi are red on their mucous surfaces and contain a muco-purulent exudate. The lungs on section exude a red sero-sanguineous fluid and present the appearance of red hepatization, the color being more marked in the areas surrounding the bronchioles. On section the bronchi exude a thick yellow, purulent, sticky material. The superior lobe of the right lung contains a caseous tubercular mass, oval in form and about the size of a hazelnut. Left weighs 520, and right 560, grams. The kidneys are very much congested, both in their medullas and cortices, and contain an excessive amount of fat in their pelves; they weigh 205 grams each. The pancreas is normal in appearance and weighs 60 grams. The spleen is slightly enlarged, but its capsule peels easily and its substance is normal; its weight is 270 grams. The liver is enlarged, and its edge extends to the umbilicus. Its vessels are full of blood and its substance much engorged. It is dark red in color on section and

the brain are adherent to the calvarium, and deposits of fibrin are seen along the great longitudinal fissure. The vessels of the pia mater are congested. The brain substance is normal, and on section nothing abnormal is found in the ventricles; its weight is 1,485 grams.

H. A. S.

T. B. P.

J. M. G.

FRACTURE OF RIBS, WITH INJURY TO LUNG.

CASE 1.

W. G.; aged 42 years; nativity, Sweden; admitted to the marine ward of St. Vincent's Hospital, Portland, Oreg., November 23, 1898; died November 24, 1898.

History.—Patient fell a distance of 20 feet through a trestle, striking upon the postero-lateral aspect of the right chest-wall. He was conveyed to the hospital eight hours after the accident considerably under the influence of whisky and morphine administered by friends. On admission the pulse was 103, thready; respirations, 26, shallow. Excepting a small cellular emphysema in the axillary line, there was no external sign of severe injuries to the viscera. Crepitus and deformity could be produced by pressure in several places over the thoracic wall; and as dullness could be elicited over the lower chest, laceration of the intercostal vessels was suspected. The breathing was short and painful, and at intervals dyspnoea would threaten. The patient's chest was well strapped with strips of adhesive plaster, and morphine and atropine given to quiet him. Very little urine was voided after the accident. He died thirty hours after admission.

Necropsy (eight hours after death).—The body of a vigorous and muscular man. Rigor mortis marked; there are evidences of an hæmoptysis around the lips; an ecchymosis around the left eye. Incision shows an extravasation of blood into the cellular tissue over the manubrium, and a simple transverse fracture of the first rib near the sternum. Right pleural cavity is nearly filled with fluid blood; fractures of the second, third, fourth, and fifth ribs, near or about the angles. These fractures are comminuted and compound internally with a loose spicula or two easily pulled away. The eighth rib shows a simple fracture near the costal articulation. There is a firm adhesion between the middle lobe and the postero-lateral aspect of the cavity. Right lung: Two large lacerations, extending some depth (1 cm.) into the substance of the organ, are seen on the posterior face. The tubes, large and small, contain fluid blood. The lung weighs 780 grams. Left pleura and lung are normal, excepting the presence of blood in the bronchial tubes. Weight of lung 700 grams. The heart and pericardium are normal; the former weighs 500 grams, and contains some mixed clots in the right auricle. Liver pale, weighs 1,800 grams; slight hemorrhage from a tear about 4 cms. long and 1 cm. deep on the anterior border at the junction of the right and left lobes. Gall bladder full and protruding. Spleen normal in size and color. Right kidney, weighing 170 grams, shows a small clot and tear extending $1\frac{1}{2}$ cms. into the gland from the hilum on the posterior surface. The left kidney is normal and weighs 160 grams. The stomach and intestines are greatly inflated with gas; no solid contents. Same in the lower bowel. The bladder contains a small amount of urine tinged with blood. The other organs were normal in macroscopic aspect.

R. B.

CARCINOMA OF OESOPHAGUS.

CASE 1.

J. H.; aged 60 years; nativity, Ireland; was admitted to the United States Marine Hospital, port of San Francisco, Cal., September 21, and died October 8, 1898.

amount of food caused vomiting. At present he says he can not take even liquid without a feeling of heaviness in the region of the stomach and vomiting shortly afterwards. The bowels have been constipated for about the last eight days. The patient is at present very weak and greatly emaciated. The abdomen is retracted, the pulse rapid but weak; the arteries are atheromatous. The treatment consisted in making the patient comfortable, procuring sleep, and in attempting to nourish by supplementary rectal enemata of peptonized milk, but without avail; the patient grew weaker steadily, and died October 8, 1898, at 12.40 p. m.

Necropsy (three and a half hours after death).—The body is that of a well developed, but greatly emaciated, elderly white male. Rigor mortis is present. The diaphragm is moderately arched. The peritoneum is normal. There is no fluid in the abdominal cavity. The intestines are empty, as is the stomach, which is very small in size. The omentum contains a very small amount of fat, and its vessels are greatly engorged. The liver is small and has a glistening appearance. On its surface small stellate areas may be seen, between which the parenchyma is slightly elevated. The lungs are collapsed and the pleural cavities are empty. The posterior surface of the left lung is bound down by adhesions. The pericardial sac contains 10 c. c. of straw-colored fluid. The heart is small and contracted; weight, 200 grams. The superficial cardiac fat is increased in the anterior inter-ventricular groove and along the right border. The larger blood vessels are not distended. The right auricle and ventricle are empty, and their walls are very thin. The left auricle and ventricle are empty; their walls are normal. The aortic and pulmonary semilunar valves stand the hydrostatic test. One of the segments of the aortic valve is calcareous, and there are calcareous deposits in the aortic wall just above the valve. The mitral valves are atheromatous. The coronary arteries are completely calcified. The heart muscle is pale in color. The right lung weighs 330 grams; the left lung weighs 280 grams. Both lungs appear normal. The bronchial glands are not enlarged. In the walls of the œsophagus a scirrhus cancer is found, slightly oval in shape, about 6 cm. long by 3 cm. wide. It is easily separated from the adjacent tissues. The lower end of the œsophagus is almost occluded by the tumor. On splitting the tumor open the lining membrane of the œsophagus is found to be destroyed by ulceration. The tissue of the tumor is pale and consists chiefly of dense fibrous tissue. The liver weighs 970 grams. The spleen is very small, measuring 5 cm. by 3 cm. On the convex surface posteriorly a dense fibrous area about 2 cm. in diameter is found. Otherwise the spleen appears to be normal. There is almost no fat around the kidneys. The kidneys weigh 120 grams each, and both are normal. The right and left adrenals weigh 10 grams. The pancreas weighs 30 grams. No further examination made.

S. O. B.
T. B. P.
J. M. G.

INFLAMMATION OF STOMACH.

CASE 1.

Pericarditis—Albuminuria.

C. H. C.; aged 36 years; nativity, England; admitted to the United States Marine Hospital, port of San Francisco, Cal., June 2, and died June 10, 1899.

History.—Patient said he had the measles and mumps when a child; smallpox when 11 years of age; scarlet fever when 13; typhoid fever when 16; double pneumonia when 25, and bronchitis when 29. Present illness began about May 8. Patient complained of soreness in the legs and of severe, aching pains in the lumbar region. The day before admission he began to have chilly sensations all over the body. He felt very nervous and had a dull headache in the frontal region.

There was soreness over the abdomen. For the last three or four days he had suffered severely from vomiting. He had no diarrhea. He had a cough, with which he raised a white phlegm. There was some pain in the chest. Physical examination showed thoracic viscera apparently normal; tenderness on pressure in the epigastric region; abdomen somewhat tympanitic, the area of liver dullness being thereby decreased; spleen not enlarged.

June 3.—During the preceding night slept little and vomited frequently, vomited material being streaked with blood. He complained of a sore throat. Examination showed the throat to be red and inflamed. Some abdominal tenderness.

June 4.—Marked jaundice of skin and conjunctivæ.

June 5.—Patient rested better during the preceding night. He had hiccoughs during the night and occasionally during the morning.

June 6.—During night before patient fell from bed in unconscious condition; his arms and legs were in constant motion and he talked incoherently and incessantly. The attack lasted over an hour. During the attack the patient sweated profusely; temperature (taken in the axilla) was 38.2° C. Hiccoughs returned; no fever; some tympanites.

June 7.—Jaundice less marked; appetite improved; increase of tympanitis.

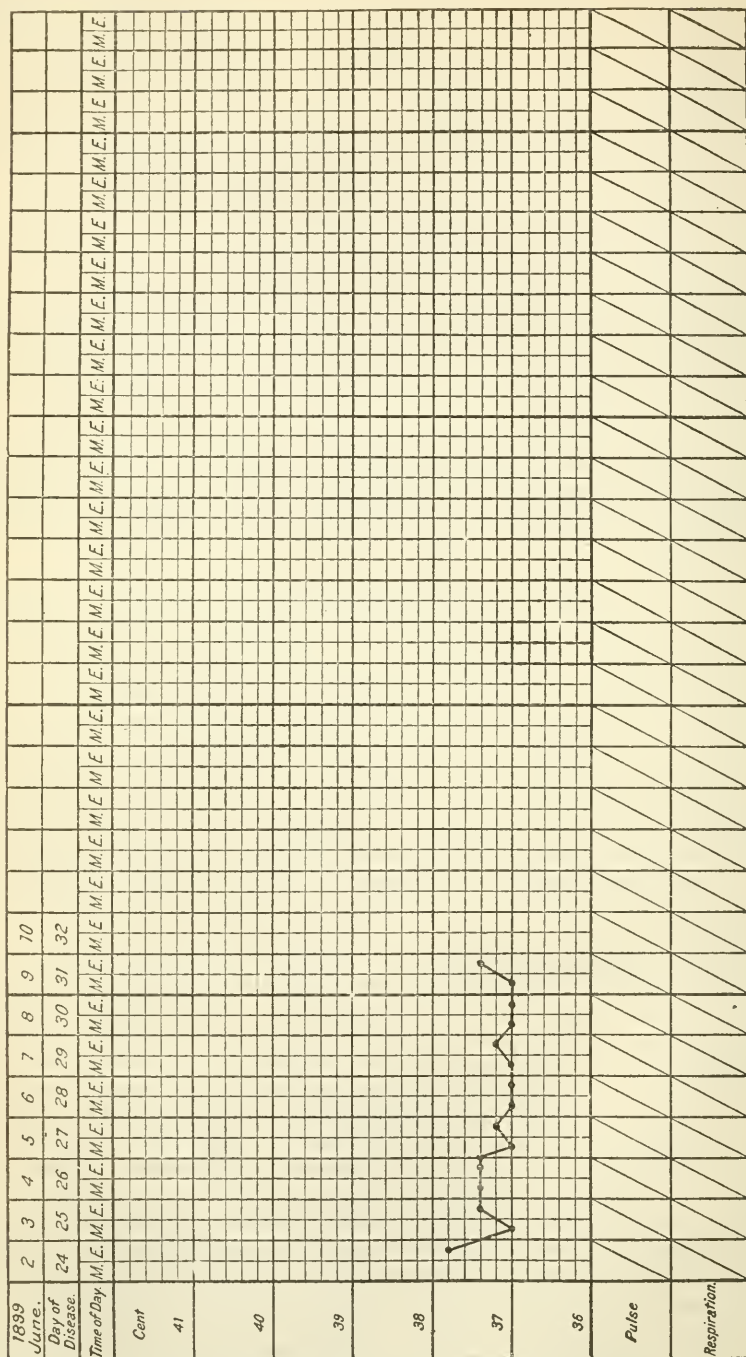
June 9.—Patient had an attack of vomiting. Patient complained of numbness and clamminess of his extremities. Examination showed considerable degree of anæsthesia of extremities and trunk, less marked in upper thoracic zone. Patellar reflex diminished. At 6 p. m. distinct paresis of both upper and lower extremities was noted.

June 10, 3 a. m.—Patient's condition markedly worse. Absolute paralysis of both arms and legs so that he was unable to move even his fingers. Ability to move head retained. Respiration was at a standstill, but was renewed artificially. Pulse slow. Sensation much impaired in extremities and on trunk below level of the nipples, but preserved to a small extent in various regions, as the soles of the feet. No pain in paralyzed limbs. The patient had complained of attacks of dyspnoea and of pain in the lower sternal and right lower thoracic regions. Death at 7.45 a. m., June 10, 1899. Treatment: The patient was put on milk diet, 30 c. c. lime water being added to each 200 c. c. of milk. He was also given bismuth subnitrate, sodium bicarbonate, and cerium oxalate. For the sore throat he was given a gargle of listerine, sodium bicarbonate, carbolic acid, and glycerin. He was also given phosphate of sodium and carbolic acid, calomel and sodium bicarbonate, Magendie's solution, and strychnine solution; also enema of potassium bromide.

Necropsy (six and one-half hours after death).—The body is that of a well-developed, well-nourished adult white male. Rigor mortis slight.

Well-marked adipose deposit in abdominal wall and omentum. Abdominal cavity contains a small amount of yellowish serum. Small intestines somewhat distended with gas. External surface of pericardium covered with fat. The pericardial sac contains a considerable quantity of a yellow, purulent fluid. The blood vessels on the surface of the ventricles are red and injected. On the wall of the right auricle several hemorrhagic areas of considerable size can be seen. Both ventricles filled with fluid blood. Heart weighs 350 grams. Beneath endocardium, investing anterior segment of mitral valve, two small hemorrhagic areas are seen. At the beginning of the aorta are a number of grayish white atheromatous patches. Left lung, weight 280 grams. Firm apical adhesions. In the outer aspect of the lower lobe is found a hard, whitish, calcareous nodule, the size of a small almond. Right lung, weight 290 grams. There are adhesions between the omentum and the abdominal wall on the left side. Spleen, weight 300 grams; splenic pulp congested and friable, otherwise normal. Left kidney, weight 255 grams. On section dark and congested. Otherwise normal. Right kidney, weight 245 grams; closely resembles left. Liver, weight 2,050 grams. Gall blad-

der distended with dark brown, moderately fluid bile and adherent to omentum.



[Marine hospital, port of San Francisco. Cal. Name, C. H. C.; age, 36 years; disease, inflammation of the stomach, acute.]

Ductus communis choledochus patent. Liver congested, considerable blood flowing from cut surface and biliary injection marked. Spinal cord: On opening the

spinal canal a large amount of fat is seen surrounding the dura mater. The dura mater normal except in upper cervical region, where it presents a yellow lusterless appearance. The vessels of the pia mater are injected. Subarachnoid fluid somewhat excessive in amount. On section the cord shows nothing abnormal. Brain: Dura mater yellowish in color and has less luster than normal. The arachnoid is slightly opaque. The pia mater is markedly injected and strips readily from the underlying tissue. The convexity of the cerebral hemispheres presents a distinctly oedematous appearance, and in places, between the convolutions, there is a deposit resembling newly formed lymph. On opening the lateral ventricles a normal amount of clear, serous fluid is found. The vessels of the choroid plexuses are markedly dilated, and a small, apparently fatty mass is found attached to each plexus.

D. M.

W. J. L.

J. M. G.

CARCINOMA OF THE STOMACH, PANCREAS, AND LIVER.

CASE 1.

R. S.; aged 44 years; nativity, Ireland; was admitted to the United States Marine Hospital, San Francisco, Cal., January 26, and died February 8, 1899, at 4.15 p. m.

History.—Patient had gonorrhea fifteen years ago. His present illness began three months ago with pain in the abdomen. This pain has persisted until the present time. He had continually and rapidly lost in weight until on admission he was very much emaciated. He said that his bowels were sometimes loose and sometimes constipated. He gave the symptoms of a severe dyspepsia, but no further history could be obtained, owing to the condition of the patient, who did not seem to comprehend what was said to him. Physical examination showed a very much emaciated individual with normal heart and lungs. In the epigastric and upper part of the umbilical regions a tumor was felt. This was hard, nodular, and immovable. It was not attached to the abdominal wall in front, but was felt deep down and seemed to be attached to the posterior wall of the abdominal cavity. The patient gradually but steadily grew weaker from the time of admission, and died February 8. Treatment consisted in the administration of whisky as a stimulant. Liquid diet was given, and as patient did not seem to digest food well, peptonized milk was given per rectum. Bowels were very torpid, and to clear them an enema was given daily.

Necropsy (twenty hours after death).—Body is that of a well-developed but very much emaciated adult white male of medium size. Two large pigmented scars are found over the anterior surface of the left tibia. The peritoneum is normal. Its cavity contains 250 c. c. of clear fluid. The intestines are a little distended with gas. The pericardium is normal. Its cavity contains 10 c. c. of clear fluid. The heart weighs 250 grams. Its cut surface is normal, as are also its valves and cavities. The bronchial glands are enlarged and hard and their cut surfaces have a fibroid appearance. The right lung is slightly adherent to the diaphragm. It weighs 540 grams and is normal. The left lung weighs 370 grams. It is adherent to the chest wall at the apex, where a tubercular focus about the size of a hazelnut is found on section. The bronchi of this lung are congested, and yield on section a mucopurulent secretion. The liver weighs 1,490 grams. It is adherent to the colon at the hepatic flexure. The surface has a mottled appearance. Two large, hard masses can be felt in the right lobe of the liver. On section these are found to be carcinomatous growths, round in form, and each 8 cm. in diameter. One of these has begun to break down, and in its center is a cavity filled with fluid and caseous material. Smaller growths are found scattered throughout the substance

of the liver. The spleen weighs 140 grams and is in a state of passive congestion. The left kidney weighs 160 grams, is lobulated, and contains several small cysts just beneath the capsule. There are a few very small, grayish-white, translucent masses in its cortex. The right kidney weighs 220 grams and is in a similar condition. The pancreas weighs 120 grams and is filled with nodular masses. The retroperitoneal glands are infiltrated with carcinoma and are very much enlarged, the tumor mass completely surrounding the aorta on a level with the last two dorsal and first lumbar vertebræ. The stomach is in a state of chronic gastritis, and the peritoneal coat contains a few nodular masses. The rectum is filled with feces, but the intestines are otherwise normal. The brain weighs 1,370 grams and is normal.

T. B. P.
H. A. S.
J. M. G.

CASE 2.

J. H.: aged, 40; admitted to the United States Marine Hospital, Chicago, June 16, 1898, and died September 26, 1898.

History.—Height, 5 feet 3 inches; weight on admission, 140 pounds. Had the ordinary diseases of childhood and rheumatism. Came to the hospital complaining of stomach trouble which began during the previous February. Sharp pains in epigastric region which have been almost constant since that time. Usually became worse about an hour after meals. Vomited once in a while, but gave no history of "coffee ground vomit." Epigastrium was painful on pressure, but at no particular point, nor could a tumor be felt even on deep pressure. A diagnosis of chronic gastritis was made. Dietetic treatment was given and the stomach washed out daily. Patient improved and was discharged on July 8. Was readmitted on August 23, when all his symptoms were aggravated. Not able to retain anything on stomach. Fed by nutrient enemata, very little food being given by the mouth. Lavage was practiced, relieving the stomach of a large quantity of fermented material. A tumor was palpated on September 11, just below the xyphoid cartilage. The diagnosis was changed to carcinoma of the stomach. Supporting treatment was given with morphia and cocaine to relieve the pain. Patient gradually failed and died on September 26, 1898.

Necropsy (twenty hours after death).—Post-mortem lividity and rigor mortis were not marked. The skull cap, brain case, sinuses and membranes were normal. The brain weighed 1,335 grams and appeared normal. Anterior mediastinum was normal. The heart weighed 175 grams, was small and contracted. All the valves were competent. Ventricular walls were normal. Pericardium was normal and contained about 50 c.c. of pale fluid. The right lung weighed 470 grams, left 570 grams, and were normal except for a slight congestion at the bases. Pleura, great vessels, and diaphragm were normal. The right kidney weighed 115 grams, the left 125 grams, and were normal except they were surrounded by very little fat. Urinary bladder contained very little fluid and was normal in appearance. Organs of generation were normal. The stomach showed externally a hard, dense tumor extending along the superior curvature about 10 cm., and along the anterior and posterior walls about 4 and 8 cm., respectively. It was nearer the œsophageal opening than the pyloric, though neither was involved. The tumor cut with difficulty and measured 3 cm. at its thickest part. On opening the stomach it was found to contain very little fluid. There were several small ulcers on its internal surface posteriorly. Stomach walls were greatly thickened. The diameters of pyloric and cardiac orifices were 2 and 3 cm., respectively. The small and large intestines were normal but greatly distended with gas. The liver weighed 995 grams. Capsule was nonadherent. Liver was very dark in color and pulpy.

The gall bladder contained about 150 c. c. of bile. The pancreas was apparently normal. The spleen weighed 70 grams and was normal in appearance.

H. C. R.

H. W. S.

CASE 3.

M. H.; aged 39; nativity Finland; admitted to the United States Marine Hospital, Boston, Mass., December 27, 1897; died September 12, 1898.

History.—On admission to the hospital patient denied venereal history, and laid claim to temperate habits; stated that he had been troubled for the past two and a half months with swelling of the legs and belly and a feeling of general weakness. Bowels were regular and appetite good. His hair had a moth-eaten appearance, and his tongue was covered with several small ulcers. Heart action was very rapid: there was marked ascites; urine had a specific gravity of 1.023 and contained no albumen. Ascites gradually disappeared under treatment. January 17 heart was very rapid and tumultuous. January 20 it was observed that the liver extended more than an inch below the free border of the ribs, and over the organ there was tenderness on pressure. Diagnosis of chronic inflammation of the liver was made. His condition gradually improved, and by May 1 he was out of bed and able to do a little light work about the hospital. There was no further change in his condition until July 1, when he began to complain of pain over his abdomen in the epigastric and umbilical regions, but he could not locate it definitely; the pain was only slightly increased by pressure. His bowels were constipated, and he suffered with sleeplessness, which was so persistent that an anodyne was given him every night. The pain was worse at night, and when the anodyne was omitted he would be observed during the night sitting on the edge of the bed bent over with pain. July 11 jaundice developed and increased rapidly. For six weeks there was no material change in his condition; appetite decreased and he lost flesh steadily. Repeated and careful examinations were made, but no tumor was ever made out. Frequent examinations of urine gave negative results. August 25 feet were swelled. Insomnia became worse and wasting more rapid. The evening of September 10 his pulse was very weak, and there was tracheal gurgling on respiration; consciousness was lost. Died at 9.30 a. m. September 12, 1898.

Necropsy (four hours after death).—Post-mortem lividity very slight. Rigor mortis absent. General nourishment very poor. Pupils dilated, the right being larger than the left. Dentition fair. Heart weighed after opening 210 grams. Pericardial sac was adherent throughout. There was fatty degeneration of the leaflets of the aortic valve and a slight infiltration of those of the mitral valve. Cardiac muscle was tough and resistant to section. Thoracic aorta small and atheromatus; abdominal aorta, femoral and brachial arteries normal. Left lung weighed 420 grams and was bile stained; no pleural adhesions in the left cavity. Right lung weighed 600 grams and was also bile stained; pleural adhesions at the apex. On opening the abdominal cavity a large growth the size of a man's two fists was found in the median line, involving the stomach and mesentery. A retro-peritoneal portion involving the pancreas was connected with the above by a constricted portion. The growth was nodular and caseous in character. The peritoneal cavity contained 1,000 c. c. of bile-stained fluid. There was marked enlargement of the retro-peritoneal glands, some of them being as large as a walnut. The stomach was empty and weighed 275 grams. The diameter of the pylorus was normal, that portion of the gut being surrounded but not invaded by the growth. A nodular, suppurating growth was found in the cardiac end, surrounding the oesophageal entrance. The transverse colon was adherent to the abdominal tumor. Liver weighed 1,470 grams, and showed marked cirrhosis;

metastatic foci of malignant growth were scattered throughout the organ. The tumor extended into the transverse fissure, but did not invade the liver tissue. The gall bladder was firmly adherent to the tumor, which surrounded both the common duct and the portal vein. Gall bladder extended below the costal margin and was displaced to the right. It was enormously distended with a black sticky fluid. Pancreas weighed 185 grams and was invaded by the growth. An unusually large artery entered the organ at the tail. Left kidney weighed 185 grams and was bile stained; cortex narrow; kidney tissue resisted section and showed cyanotic induration; capsule stripped off easily, and the surface of the organ presented many pale areas. Right kidney weighed 170 grams and showed the changes of contraction and induration to a more marked degree than the left. It was also bile stained. Bladder extended above the symphysis pubis; bladder wall was thickened. Urethra normal. Prostate hard and enlarged. Left testicle weighed 50 grams; right testicle, 49 grams. Inguinal canal normal. Left suprarenal body weighed 20 grams and was involved by the growth. Spleen weighed 160 grams and was harder than normal. Head, skull, and scalp normal. There was an excess of fluid in the subdural space. Brain weighed 1,300 grams. Neither ventricles nor brain tissue presented anything abnormal.

F. I.

TYPHLITIS.

CASE 1.

W. D. C.: aged 43; nativity, Maryland; admitted to United States Marine Hospital, Memphis, Tenn., February 1, 1899; died February 2, 1899.

History.—Five days before admission patient stated he was suddenly taken with pains in right side; increased by pressure or motion; soon followed by nausea and vomiting. He was constipated from the commencement of the attack, and after the first few days commenced to suffer from constant desire to go to stool, but was unable to pass anything. To relieve this condition he took two teacups full of castor oil without effect. On admission he complained of pain and tenderness in right side from a point just below the liver to the right inguinal region, the point of greatest tenderness being located about the hepatic flexure of the colon. He had had no movement from the bowels for four days, and suffered from an unceasing desire to go to stool. He could retain nothing on his stomach, and vomiting of bilious matter was almost constant. Temperature on admission 37.1; pulse very weak. He was given strychnia and morphia hypodermically, and the symptoms appearing to indicate obstruction from intussusception, a high enema of water was given, 8 liters being injected. About one-fourth of this was voided, bringing no fecal matter; the remainder was retained until death, which occurred on the following day.

Necropsy (twelve hours after death).—Rigor mortis marked; body obese, subcutaneous abdominal fat about 3 inches thick. Heart covered with fat—a part of general obesity; left ventricle walls thickened; cavity diminished in size; right ventricle normal; large ante-mortem clots in all cavities; valves normal. Weight of heart 420 grams. Right lung not adherent to chest wall; small calcified spot on anterior surface of upper lobe; hypostatic congestion posteriorly; weight 520 grams. Left lung adherent to parietal pleura throughout; hypostatic congestion; weight 470 grams. Liver: Upper surface adherent to diaphragm; large spots on upper and lower surface, dark in color, almost black, slightly depressed and almost necrotic in appearance; weight 2,420 grams. Small intestines on right side glued together and to large intestines by inflammatory lymph. A mass of inflammatory lymph as large as an orange was found in right side in front of and to the outer side of the hepatic flexure of the colon, and in this mass was found the necrotic extremity of the vermiform appendix, which was fully 7 inches long. It

is supposed that the pressure by this inflammatory lymph produced the obstipation, and although it did not prevent the passage of the fluid of the enema it did prevent its return, while the unusual length and location of the end of the appendix moving the point of greatest tenderness several inches from the McBurney point added another element of confusion, which led to a mistaken diagnosis. The small intestines contained considerable fluid, probably that of the enema, floating on which a large amount of oil was seen, no doubt the castor oil he had taken before admission. Kidneys congested; capsules not adherent; weight, right kidney 240 grams, left 250 grams. Spleen normal; weight 280 grams. Other organs normal.

G. M. M.

HEMORRHAGE FROM THE BOWEL.

CASE 1.

J. J. B.; aged 63; native of Maryland; was admitted to the hospital, Norfolk, Va., on the evening of August 22, 1898. Gave history of having had malarial chills for the past three or four weeks. Temperature was 38°; pulse, 118; respiration, 32. He was put to bed and quinine and calomel and soda given. The next morning temperature was 36.5; pulse, 96; respiration, 24. Patient showed slight symptoms of paralysis of tongue and facial muscles. Later in the day he was taken with symptoms of intestinal hemorrhage, and although every effort was made to arrest it, he died on the following morning.

Necropsy (twelve hours after death).—Rigor mortis well advanced. Calvarium was removed and dura mater found thickened and vessels engorged. Brain slightly "wet," but otherwise normal. Thorax: Adhesions in both pleuræ. Lungs: Plastic congestion in left; right lung contained some passive pneumonia, and an old scar was shown on the outside. Heart: Considerably enlarged and dilated; considerable endocarditis; there was calcareous degeneration of mitral valve, and the coronary arteries were thickened; heart muscle fatty. Abdomen: Spleen slightly under size; left kidney slightly enlarged; capsule strips fairly easily; surface granular; cysts on surface of kidney about size of a small shot; fatty; cortex pale; pyramids congested; right kidney slightly smaller than left; cortex very thin. Capsule slightly adherent; other conditions same as in left kidney; liver enlarged, firm, and cirrhotic; gall bladder full of dark thick bile; stomach distended; large intestine contained a bloody discharge and walls inflamed; small intestine normal. Bladder much contracted and contained a small quantity of pus; walls thickened. Prostate slightly enlarged.

E. E. F.

DIARRHEA.

CASE 1.

J. P.; aged 52 years; nativity, Norway; admitted to United States Marine Hospital, Baltimore, Md., December 29, 1898; died February 7, 1899.

History.—Family history, negative; previous personal history shows severe attack of diarrhea lasting for five months previous to admission. On entrance to the hospital patient was very weak and emaciated. Bowels moved 8 or 10 times daily, actions being watery and offensive and not accompanied by pain. Stomach was irritable, rejecting food frequently. Had swelling and scars on legs that looked like tertiary lesions, but he denied having had syphilis. Was put to bed on milk diet and given pills of opium and tannic acid. Under this treatment the number and character of actions improved, and he gained sufficient strength to get up for some hours daily. About February 1 the diarrhea recurred and was checked by salol and bismuth and opium, but the patient's strength failed rapidly. He had no rise of temperature at any time, but gradually sank and died.

Necropsy (ten hours after death).—Body very much emaciated; cadaveric lividity well marked on posterior surface. Rigor mortis present. Abdomen sunken in and discolored. Both legs presented discoloration from old ulcers, and also swelling of the bones, probably syphilitic. Skull cap removed; brain and membranes examined and were apparently normal. Abdomen opened; no abnormal appearance observed. Chest opened; pericardium contained about 5 c. c. straw-colored fluid. Heart very small and relaxed; weight, 195 grams; cavities and valves normal; pulmonary artery and veins contained dark clots. Lungs slightly adherent to parietal pleura. Left lung normal; weight, 476 grams. Right lung consolidated in upper lobe and middle lobe; would not float in water; upper lobes being deep red in color, dense on section, with smaller tubes filled with a bloody exudate. Abdominal contents examined. Liver: Weight, 950 grams; normal in appearance. Kidneys normal; weight, 130 grams each. Pancreas normal. Spleen small and contracted, gray in color exteriorly. Stomach opened; contained food; mucous membrane was pigmented in spots, showing chronic inflammatory condition. Intestines opened and examined: mucous surface slightly congested; peritoneal surface normal. Peyer's patches and vermiform appendix normal. No ulcerations seen at all. Mesenteric lymph glands were enlarged. Bladder normal.

S. R. T.

CARCINOMA OF RECTUM.

CASE 1.

J. C.; aged 31 years; nativity, Ireland; admitted to the United States Marine Hospital, Cleveland, Ohio, December 12, 1898; died December 14, 1898.

History.—Patient was transferred from Sandusky, with a diagnosis of obstruction of bowel. He stated on entering that his illness dated from November 1, 1898, at which time his abdomen started to swell; later he suffered from pain in the abdomen, vomiting, and constipation. On November 13 he put himself under the care of the acting assistant surgeon at Sandusky, Ohio. His abdomen was at this time slightly swollen. He grew steadily worse, and the abdominal distention increased. He was transferred to the United States Marine Hospital, Cleveland, December 12, 1898. At date of admission was much emaciated, anæmic, tongue pale and flabby, abdomen tympanitic, with dullness in flanks, which changed with the position of the patient: heart normal, except slight accentuation of second sound at aortic area; pulse 90, regular, fair volume; arteries slightly thickened; lungs normal; liver could not be palpated on account of great abdominal distention. There was a continual discharge of fluid fecal matter in minute quantities, with great straining. An attempt was made to pass a rectal tube, but was unsuccessful. Rectal examination revealed an obstruction at extreme upper part of rectum, below which area the rectum was patulous and flabby and the sphincters without tone. There was a hard and nodular growth on anterior surface of rectum. Manipulation of the strictured area allowed a large quantity of gas to escape, which temporarily relieved the tenseness of the abdomen. An inguinal colotomy was performed on December 13. The usual incision was made, and as the abdominal wall was opened about 4,000 c. c. of serum escaped. On palpation through the abdominal incision a large nodular mass was detected in the pelvis; all the pelvic structures were matted together. The lumbar glands were enlarged and indurated. The pulse was good throughout the operation. He rallied slightly from the operation, and with the aid of stimulants seemed to do fairly well for a short time, but later he became unconscious, pulse very weak, respiration labored, and died at 4 p. m., just twenty-four hours after the operation.

Necropsy (eighteen hours after death).—Rigor mortis slightly marked. Lividity marked. Papils dilated. The pericardial sac contained 75 c. c. of serum. The heart weighed 242 grams, the valves were all competent, and the ventricles appar-

ently normal. The right side of the heart contained a large ante-mortem clot which extended for some distance into the inferior vena cava. Larynx and trachea normal. Left pleural cavity entirely obliterated by old adhesions. The left lung weighed 670 grams, was quite oedematous and showed a marked hypostatic congestion. The right pleural cavity presented some adhesions posteriorly. The right lung weighed 688 grams and was also oedematous and congested. The diaphragm was thickened and covered with nodules in the region of liver. The peritoneum was intensely congested. The stomach was firmly bound to liver; the mucous membrane was congested and covered with a thick tenacious mucus. The pylorus was contracted and nodular. Small intestine congested throughout. The appendix was firmly bound down by old adhesions. The large intestine was congested, most marked in descending colon. The rectum contained a malignant stricture about 5 inches from anus, and the anterior wall was extensively involved by the growth. The liver weighed 1,052 grams, presented a nutmeg appearance, and contained a growth about the size of a cricket ball which was about the consistency of a turnip. Gall bladder contained 25 c. c. of bile. The lesser omentum was firmly adherent to the liver, and studded throughout with nodules. The great omentum was a mass of nodules varying in size from a pea to a walnut. The pancreas was nodular and so adherent to surrounding tissues that it could not be separated. The left kidney weighed 150 grams, and was apparently normal. The right kidney weighed 215 grams; was firmly adherent to liver. There was a marked hydronephrosis, with atrophy of the entire medulla and the greater part of the cortex. The right ureter was greatly dilated, and was involved near its entrance into the bladder by the malignant growth which produced the stricture of the rectum. Left ureter normal. The posterior wall of the bladder was extensively involved by the growth. Spleen weighed 106 grams; capsule wrinkled, otherwise negative. Membranes of brain were normal. Brain weighed 1,423 grams, apparently normal.

H. W. W.

SMALL ROUND-CELLED SARCOMA OF RECTUM.

CASE 1.

C. P. H.; aged 68 years; nativity, West Virginia; was admitted to the United States Marine Hospital, San Francisco, Cal., October 8, 1896, and died May 15, 1899.

History.—Patient had been troubled about five months with bleeding piles. There was not much pain on having a passage, but a great deal of hemorrhage. He said he thought he would bleed to death the day prior to admission. He had some pain on sitting down. There was no history of venereal trouble except gonorrhea. Examination showed, posterior to the anus and laterally, an elevated mass of raw tissue about 2 by 4 c. m. in size. This extended through the anus and into the rectum for a distance of 6 or 7 c. m. This tissue was friable and bled easily. In the tissues surrounding the rectum for about 7 c. m. on either side could be felt hardened nodules. Posteriorly these nodules were ulcerated and bled easily. A fluid resembling "cancer juice" issued from the anus. There was some pain in the diseased part. A movable tumor was felt in the abdominal wall about 2 by 1 by 1 c. m. in size. There was a mitral regurgitant murmur. The urine was normal. A small piece of the diseased tissue removed for microscopical examination showed the new growth to resemble "small round-celled sarcoma." The patient refused to undergo an operation for the removal of the growth. On December 30, 1896, examination showed a cauliflower-like mass around the anus and extending for a distance of about 10 c. m. into the rectum. The growth was deeper at the posterior verge of the anus. On February 17, 1897, the patient was operated under ether and the fungous mass within the rectum

curetted away. The condylomatous growth external to the anus was also removed. On May 1, 1897, examination showed a granulating fungous mass surrounding the anus. It was elevated about 1 c. m. above the surrounding tissues. The rectum admitted the finger, but had been so encroached upon by the new growth that signs of obstruction began to appear. On June 1, 1897, examination showed that some of the new growth had sloughed away so that fecal passages were freer. On July 15, 1897, examination showed a raw surface back of the anus extending for 4 or 5 c. m. on each buttock. It was not indurated and but slightly painful. February 20, 1898, on examination two granulating surfaces were found between the buttocks, extending into the rectum. A small amount of the new growth had projected into the opening and caused a great deal of annoyance on defecation. This was excised. January 2, 1899, patient became more cachectic in appearance each day. May 14, 1899, patient gradually became weaker, the exhaustion becoming more marked. Patient died at 2.40 p. m. May 15, 1899. Treatment: The diseased parts were cleansed daily with antiseptic solutions and soothing ointments applied. Cathartics and astringents were given, as indicated by the state of the bowels. Stimulants and tonics were used as the patient's strength began to fail. Silver nitrate was applied to the new growth. Carbolic acid was injected directly into the new tissue. None of the treatment seemed to do any good, and the patient persistently refused to undergo an operation.

*Necropsy (twenty-four hours after death).—*The body is that of a fairly developed, greatly emaciated, elderly, white male. Rigor mortis is present, but is slight. Post-mortem lividity is well marked. Beginning at the angle of the right scapula and extending downward is an irregular bed sore. It is about 15 cm. long and about 9 cm. in width at its broadest part. Over the sacral region is a bed sore about 15 cm. in diameter, irregular in outline and necrotic. There is a similar sore just posterior to the right trochanter. Surrounding the anus and extending from the coccyx to the junction of the scrotum with the perineum, occupying the inner surfaces of both nates, is a large ulcer, through which the rectum prolapses. The floor of the ulcer is covered with a dirty, gray, necrotic slough. Its edges are well marked from the surrounding tissue, but slightly everted and reddened. The base is formed by sloughing tissue. As far up as can be seen, about 15 cm., the rectum is necrotic. The posterior wall has sloughed entirely away. The sides of the ulcer are connected with the rectum by bands of necrotic tissue. The coccyx is exposed and roughened and shows evidence of being invaded by the infection. There is marked œdema of the legs. There are bedsores on both heels and on the outer side of the right ankle. On the left side over the ninth costal cartilage is a cyst that has undergone a calcareous degeneration. In the right inguinal region there are three tumors about 2 cm. in diameter, which, on being incised, exude a thin, sanious fluid, floating a large proportion of caseous material. The omentum is adherent to the peritoneum of the anterior abdominal wall. There are also bands of adhesion between the liver and the anterior abdominal wall. The liver is adherent to the stomach and its entire superior surface is adherent to the diaphragm. A small lump of calcareous material is found in the mesentery. The mesenteric glands are slightly enlarged. There are adhesions between the ascending colon and the convolutions of the small intestine. The exterior of the pericardium is apparently normal. The interior has some flakes of fibrin on its surface. The pericardium contains 10 c. c. of clear yellow fluid. The heart is normal in size. There is a slight excess of fat on its surface. The right auricle contains a small amount of blood. The right ventricle is filled with a large red clot. The left auricle is filled with clotted blood. The left ventricle is empty and its walls are somewhat thickened. The aortic valves are calcareous but competent. The beginnings of the ascending aorta and of the coronary arteries are sclerotic. The

mitral valve is thickened and contains sclerotic patches. The pulmonary semi-lunar and the tricuspid valves are normal. All the valves are competent. The heart weighs 370 grams. The spleen weighs 150 grams. The capsule is thickened and contains several areas lighter in color and apparently thicker than the surrounding tissue. The substance of the spleen is red in color. The left kidney weighs 150 grams. The capsule strips off readily, leaving a smooth lobulated surface, mottled in appearance, and lighter in color than is normal. On section the cortex is thin, pale, and anaemic. The malpighian pyramids are pale. The fat around the pelvis is increased, but the interior of the pelvis is apparently normal. The right kidney is small, weighing only 50 grams. The capsule is adherent and the surface very irregular. On section the cortex is thin and the medullary portion is small and pale in color. The pelvis is congested and there is a deposit of fat surrounding it. The liver weighs 1,200 grams; the capsule is thickened. The tissue shows normal resistance to the knife. On section the substance is slightly lighter in color, otherwise it is normal. The left lung is adherent to the chest wall over its entire surface. It is also adherent to the pericardium. The parietal pleura is adherent over its entire surface. The pleura is greatly thickened. The lung weighs 650 grams. On section the tissue is oedematous. The mucous membrane of the bronchi is reddened and thrown into rugæ, giving evidence of chronic bronchitis. The right lung weighs 500 grams and is apparently normal. The brain weighs 1,220 grams. There are adhesions on either side of the longitudinal sinus. On section the brain is apparently normal.

J. B. G.

W. J. L.

J. M. G.

Microscopical examination.—Portions of tissue subjacent to ulcer hardened in alcohol. Sections cut perpendicularly to ulcerating cutaneous surface consists chiefly of a dense fibrous tissue, probably cicatricial. The tissue forming the floor of the ulcer is composed of round and epithelioid cells. The walls of the blood vessels are thickened. The cutaneous epithelium, where not destroyed by ulceration, shows a tendency to proliferate. No giant cells. Sections stained for tubercle negative.

Appearance of sections indicates tubercle, though examination not satisfactory by reason of imperfect preservation.

INFLAMMATION OF LIVER.

CASE 1.

Acute suppurative, tropical.

W. E. W.; aged 25 years; native of England; admitted to the marine ward of the German Hospital, Philadelphia, Pa., August 16; died August 25, 1898.

History.—Present illness began April 6, 1898, with severe pain and tenderness in region of liver, some conjunctival jaundice and fever. His condition was diagnosed by the physician in attendance as hepatic abscess, but on operation, three weeks later, no pus was found. After the operation fever diminished, appetite fair, but gradual loss of weight. July 6 was seized with severe cough with purulent expectoration, very profuse at first but gradually diminishing. Following this some improvement in his condition, with increase in weight. On admission temperature 38, pulse 130, respiration 32, skin quite moist and lemon yellow in color; slight cough, with brownish red expectoration. Sleeps well and has little or no pain. Patient is much emaciated. Right scapula and lower portion of

right chest are prominent. Over this area there is diminished vocal fremitus and resonance, dullness on percussion and faint crackling râles. At fifth rib, in right anterior axillary line, a superficial to-and-fro friction sound is heard. Heart sounds rapid but normal. Apex beat displaced slightly to right. Liver dullness does not extend below costal margin. Urine contains albumin, hyaline casts, and leucocytes. Feet and eyelids markedly œdematous. Severe diarrhea for past two months.

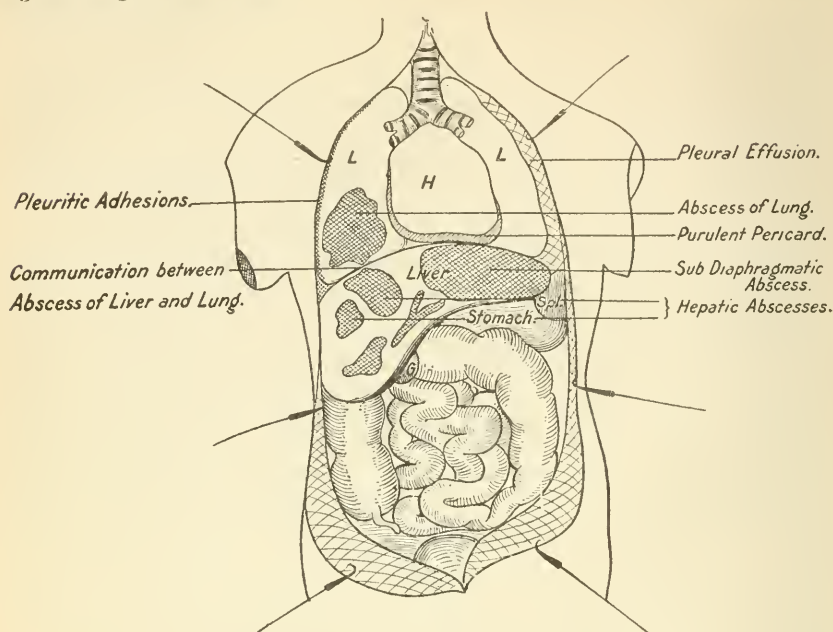
August 17.—Examination of stools for amœba coli negative.

August 20.—Sputum gives reaction for bile. Blood examination: Hæmoglobin, 62; erythrocytes, 3,560,000; leucocytes, 20,000.

Necropsy (eleven hours after death).—Clinical diagnosis: Inflammation of the liver (suppurative), chronic Bright's disease, valvular disease of the heart, abscess of lung. Anatomical diagnosis: Left-sided pleural effusion, chronic adhesive pleuritis of the right side, abscess with pneumonic consolidation of right lung, suppurative pericarditis, atheroma of mitral and aortic valve leaflets, cardiac hypertrophy, subdiaphragmatic abscess, suppurative hepatitis and pyelophlebitis, ascites, chronic parenchymatous nephritis. External appearances: Body of an emaciated young man, apparent age about 26 years, weight about 56 kilos, height, 1.7 meters; circumference at shoulders, .97 meters. The skin is of an intense lemon-yellow color, the bony points markedly prominent. The abdomen is much distended with fluid and gas; cadaveric rigidity is very marked; cadaveric lividity is present in the posterior and dependent portions of the body and thighs. Body nourishment is very poor. On section, much cloudy serum escapes from the abdominal wound. The recti muscles are of a deep red color and are atrophic; there is but slight amount of firm, pale-yellow abdominal fat. On continuing the incision in an upward direction, a large amount of a thick greenish-yellow pus escapes from a point 1 cm. to the left of the tip of the ensiform cartilage. The normal positions and relations of the abdominal and thoracic viscera are disturbed; the liver is enlarged and is downward and to the left; the heart and pericardium upward and to the right. There is an extensive effusion into the peritoneal cavity. Circulatory organs: Heart and pericardium are displaced upward and to the right by a large collection of greenish-yellow pus, occupying a position to the left of the ensiform cartilage and situated between the diaphragm and lesser hepatic lobe. The pericardium is distended by an enlarged and hypertrophic heart and by a quantity of thick, purulent, yellowish material. The parietal and visceral layers of the organs are found to be covered with a thick, yellowish, fibrino-purulent exudate; the pericardial cavity contains about 30 c. c. of a thin, yellowish, purulent material. No adhesions have formed at any point. The heart is enlarged and hypertrophic (weight not taken, in order to preserve the pathological specimen intact), almost reaching in some positions a thickness of 2.5 cm. The walls of the organ are firm in consistence, dark red in color, with small, yellowish, probably fatty, striæ distributed throughout. The organ is tightly contracted; the left ventricular cavity is of normal size, containing a small quantity of dark red fluid blood. The mitral orifice barely admits two fingers up to the first joint. The chordæ tendinæ are thickened and the columnæ carneæ are hypertrophic. The valve leaflets are increased in thickness, but are in all probability competent, their free edges approximating throughout. The left auricular cavity is slightly enlarged and is found to contain a small quantity of fluid blood. The aortic valve leaflets are generally thickened, although there are no localized spots of atheromatous degeneration. Their free edges approximate throughout; the valve stands the hydrostatic test. The right ventricular walls are relatively diminished in thickness, the greatest diameter at points reaching 1 cm. The corresponding cavity is of normal size; it contains a small currant-jelly clot, which extends for a short distance into the pulmonary vein. The columnæ carneæ and chordæ tendinæ are of normal size. The tricuspid orifice readily

admits the first three fingers up to the first joints. The leaflets are pale red in color and apparently not diseased. The right auricular cavity is of normal size; it contains a small ante mortem clot, soft in consistence, which extends through the auriculo-ventricular orifice into the right ventricle. The coronary arteries are normal in size and do not appear to be atheromatous. The walls of the arch of the aorta are of normal thickness and are free from atheroma. The descending thoracic and abdominal aorta has walls of normal thickness. On section there are found many irregular areas of beginning atheroma immediately surrounding the orifices of the abdominal and thoracic branches. The smaller arteries are thickened, but not to any degree atheromatous. Respiratory organs: The nares present an apparently normal appearance. The larynx and trachea have walls of normal thickness; the mucous membrane of both of these structures, but particularly that of the latter, is swollen, oedematous, and much congested. This is particularly evident in the lower 7 cm. of the trachea and throughout the whole right bronchial tube. Here the mucous membrane is of a dark red color. The mucous membrane is much congested and is the site of many small capillary punctiform hemorrhages. The lumen of the left bronchus contains a small quantity of yellowish, blood-stained mucopurulent material. The left pleural cavity contains about 500 c. c. of clear straw-colored serum, which has displaced the corresponding lung and heart toward the opposite side. There are no adhesions between the parietal and visceral layers, which structures present a perfectly normal appearance. The posterior and inferior aspect of the organ is deeply congested. The peri-bronchial glands are not enlarged. On section much frothy, blood-stained serum exudes from the freshly cut surface. The surface of sections presents a mottled bluish-red appearance, the lower portion of the inferior lobe being particularly congested. There is a general bronchitis of this lung, as is evidenced by the prominence of the thickened bronchial tubules, with thickened and congested mucous membranes. Otherwise the lung presents no further pathological characteristics; weight, 500 grams. The right pleural cavity is obliterated by a mass of dense fibrous and oedematous adhesions. These are only torn through with great difficulty, and in doing so much of the pulmonary tissue is torn away. The right lung was greatly torn during its removal from the chest. It is of a dark red color below, mottled grayish red color above. The middle and inferior lobes are firm on pressure, and seem to be almost completely consolidated. In these positions the lung does not crepitate on pressure. A section of lung tissue from the positions, when thrown into water, fails to sink. The upper lobe still crepitates on pressure and is apparently not much diseased. The surface of section is of a dark bluish-red color below and of a lighter hue above in the position of the superior lobe. The superior lobe, except for a slight general bronchitis, is not much diseased. The middle and inferior lobes are dark grayish-red in color, and firm to the touch. The center of the inferior lobe is occupied by an irregular cavity about the size of a lemon. This cavity, which is lined by a dirty, bluish-gray membrane, contains a small quantity of blood-streaked, yellowish, purulent material. Four or five trabeculae of sloughing pulmonary substance extend from one wall of the cavity to the other. These are broken through readily. This cavity extends downward through the inferior lobe of the lung, through the diaphragm to within 0.5 cm. of a large purulent collection in the extreme upper and inner portion of the greater lobe of the liver. The barrier consists of fibrous tissue, and it is here in all probability that the hepatic abscess first discharged its purulent contents into the lung. The pulmonary cavity is surrounded by an extensive area of consolidation, which embraces the whole of the middle lobe. This portion of the lung fails to crepitate on pressure, but does not tear readily. A section taken from the lung in this portion fails to sink when thrown into water. The abdomi-

nal conditions will be more readily appreciated if reference is made to the following semidiagrammatic sketch:



Abdomen contents: The peritoneal cavity contains about 1,500 c. c. of clear straw-colored fluid, the intestines are slightly distended, the stomach is displaced downward and backward, and the liver is slightly enlarged, but otherwise the organs bear a normal relation to each other. Gastro-intestinal tract: The tongue, aside from being covered with a thick, dry, brownish-yellow fur, presents a normal appearance. The pharynx and esophagus are apparently normal. The stomach is displaced downward and backward by an enlarged liver. It is slightly distended with fluid and gas, and is capable of holding about 1,500 c. c. fluid. The organ is peculiarly shaped, having an hourglass appearance, the point of constriction being about 16 cm. from the pyloric end. The walls of the organ are increased in thickness and apparently chronically inflamed. The mucous membrane is thickened and congested anteriorly, while posteriorly it is somewhat eroded, due, in all probability, to a post-mortem digestive process. The diameter of the pyloric orifice reaches 2.3 cm., that of the cardiac orifice reaching 3 cm. The small intestines are slightly distended with gas and fluid contents. The mucous membranes present a normal appearance. The large bowel presents appearances similar to those exhibited above. The mucous membrane, however, is swollen, cedematous, and much congested. The capillaries within the mucous membrane are slightly injected. The lumen of the bowel contains a large quantity of yellowish-brown fluid faecal matter. The rectum is apparently normal. The mucous membrane presents pathological characteristics similar to those observed in the above. The liver is much enlarged (weight not taken, in order to preserve the pathological specimen intact), pale yellowish-red in color, with many irregular apparently fatty areas scattered at various points beneath the normal hepatic capsule. The organ is firm to the touch, with exception of a point at about the extreme internal portion of the greater lobe, at which point there seems to be some slight fluctuation. The edges of the organ are rounded; the substance of the organ is firm and perfectly elastic. On section the surface of

section is yellowish-red in color, with many irregular, apparently fatty, areas scattered at various intervals throughout. Three irregularly round abscess cavities containing from 30 to 90 c. c. of yellowish-green purulent material are found toward the upper and inner portion of the major lobe. The largest abscess cavity is found in the extreme upper and inner portion of the major lobe. It contains about 90 c. c. of a thick yellowish purulent material and is in intimate relation with the abscess cavity previously described as occupying the right lower pulmonary lobe. It is only separated from the latter by a thin barrier of fibrous connective tissue. The diaphragm seems to have been perforated in this position. The other abscess cavities occupying this lobe are much smaller and are more circumscribed. The hepatic veins in this lobe are more or less distended with fluid blood, and in certain positions, particularly near the inferior border, are filled with a sanguino-purulent material. The organ is generally congested, much free blood flowing from the freshly cut surface of section. The lesser lobe seems to be free of purulent collections. Situated above the lesser lobe and encroaching slightly upon the hepatic tissue is found a large collection of greenish yellow, thick purulent material. This collection is limited above by the diaphragm and below by the lesser hepatic lobe. The walls of this abscess cavity consist of a thick, dense fibrous structure, covered internally with a thick yellowish fibrino-purulent exudate. The abscess cavity contains almost 1,800 c. c. thick creamy pus, which upon bacteriologic examination is found to consist mainly of leucocytes and fatty detritus. There was no micro-organismal growth following the inoculation of the material upon agar-agar. This collection was localized and had no communication with any viscus or cavity. The pancreas weighs about 6 (?) grams, is pale red in color and firm to the touch. The organ is apparently normal. Genito-urinary organs: Left kidney is enlarged, swollen, and pale red in color, weight 800 grams. It is surrounded by a small quantity of pale yellow fat. On section the capsule is found to strip readily, revealing a pale red, smooth, almost fatty surface of kidney structure. The capsule is not adherent at any position. The cortex of the organ is much increased in thickness. It contains many injected capillaries, radiating outward to the periphery of the organ. The pyramids are a bright red color, and contrast strongly to the pale red, bacony appearance exhibited by the cortex. The right kidney presents characteristics similar to those exhibited by its fellow of the opposite side. It is slightly smaller in size, weighing 180 grams. The pelves and ureters are apparently normal. The bladder is slightly distended with pale yellow urine. The vesical walls are normal in thickness; the mucous membrane is pale red in color and apparently normal. The prostate is slightly increased in size and is very firm to the touch. The urethra presents a normal appearance throughout; no strictures are present. Suprarenal bodies: Left suprarenal body is yellowish brown in color, firm to the touch; its cortex is normal; its medulla is slightly hemorrhagic; weight, 10 grams. The right capsule is somewhat swollen; weight, 8 grams; it presents characteristics similar to those seen in the above. Spleen: The spleen is small in size; weight, 150 grams. It is dark bluish red in color and firm to the touch. Its capsule is slightly adherent to the lower surface of the diaphragm. These adhesions are friable and are broken through rather readily. On section the capsule is found to be slightly thickened; the surface of section is dark bluish red in color; the splenic pulp is firm to the touch. Many fine fibrous trabeculae are seen radiating throughout the splenic pulp. There seems to be a general increase of fibrous connective tissue throughout. An examination of the contents of the skull was not permitted.

Microscopical examinations.—A section through the left ventricle and the superjacent pericardium reveals the latter covered by an extensive exudate. The latter in part consists of a delicate fibrinous reticulum, in the meshes of which are contained many polynuclear leucocytes, but there are in addition many

mononuclear round cells and fibroblasts. In other situations the fibrinous tissue forms thicker and more homogeneous bands radiating in irregular directions. Here and there throughout the exudate there are small aggregations of small round cells, and toward the free edge of the exudate, as elsewhere, there is considerable necrosis. Nearer the heart muscle there is some attempt at the formation of new blood vessels. The muscle fibers themselves appear hypertrophic and the intermuscular connective tissue increased in amount. About the blood vessels this latter overgrowth is especially evident and has induced some atrophy of the adjoining muscle fibers. This intermuscular connective tissue presents also some round cell infiltration. The blood vessels are markedly thickened; the lumen of many of the smaller ones seem almost entirely occluded. A section through the wall of the abscess cavity in the lower lobe of the right lung reveals toward the cavity considerable necrosis of the pulmonary tissues. That which is still partially preserved shows extensive infiltration with small round cells, the latter being in some localities collected into small groups. The adjacent pulmonary parenchyma is much compressed and pervaded by rather dense bands of fibrous connective tissue, in many places poor in nuclei, in others revealing a moderate number of elongated nuclei. The distorted pulmonary alveoli are considerably filled with desquamated cells and detritus, many of the cells containing a great quantity of pigment. The blood-vessel walls are much thickened, and there is considerable bronchitis and peribronchitis. A section through the diaphragm in the region of the subdiaphragmatic abscess and its points of rupture through the diaphragm reveals the latter the seat of very acute inflammation and extensive round cell infiltration. On either side of the diaphragm there is considerable exudate, showing marked necrosis and infiltration with polynuclear leucocytes. The muscular fibers are in many situations widely separated by round cell infiltration, and some have lost their striations and appear necrotic. A section through the liver in the neighborhood of the abscess shows almost total necrosis, the structural characteristics of the organ being distinguishable with difficulty. There is evident and extensive perilobular connective tissue hyperplasia and some proliferation of the bile ducts, but other details can not be made with definiteness because of the marked necrosis.

C. H. W.

H. W. A.

CASE 2.

R. Z.; aged 32 years; nativity, Germany; was admitted to the United States Marine Hospital, San Francisco, Cal., February 28, and died March 9, 1899.

History.—Patient contracted gonorrhea and syphilis three years ago. He has had no other illness and never drank to excess. His present illness began four months ago with swelling of the feet and ankles. This disappeared in a few days and did not return for some weeks. He felt languid and tired all the time. He had at that time symptoms of a mild gastritis, but no vomiting. Five weeks ago he noticed his abdomen growing larger. It rapidly increased in size, and ten days ago it was aspirated and two gallons of fluid withdrawn. At that time he was in Honolulu, Hawaii. On admission to this hospital the abdomen was greatly distended again. On physical examination, find a poorly developed, poorly nourished individual. The thoracic viscera are apparently normal, but are somewhat displaced by the extreme ascites. The abdomen is much distended and a distinct wave can be felt on percussion. The abdominal viscera could not be defined on account of the fluid present. March 1, 1899, the peritoneal cavity was aspirated and 7,000 c. c. of clear fluid withdrawn. The patient had a large, complete, indirect scrotal hernia of the right side, the sac of which was filled with the ascitic fluid. March 2, 1899, the patient complained of severe diarrhea, which had been present for three days. The stool was examined and on the surface was found a frothy

material with a deep-green color. Large curds of undigested milk were seen floating in the stool. March 9, 1899, at the morning sick call the patient was apparently doing well and remarked that he felt better. At 4.30 p. m. he got out of bed and went to the water-closet, where he was found a few minutes after in a state of collapse. He was placed in bed, stimulation given in the form of strychnine and brandy hypodermically, but patient died at 7 p. m.

Treatment consisted in aspiration to relieve ascites and the exhibition of Basham's mixture and iodide of potassium, and opiates for the obstinate diarrhea.

Necropsy (sixteen hours after death).—The body is that of a white adult male of medium size, rather poorly developed and poorly nourished. Abdomen distended. The peritoneum is thickened, but smooth and shining. The intestines are very slightly distended. The peritoneal cavity contains 2,000 c. c. of clear fluid with a few fibrin flakes suspended in it. The pericardium is normal and contains 1 c. c. of clear fluid. The heart is slightly fatty in appearance and weighs 260 grams. Its valves are all competent and its cavities normal. There are a few adhesions over the anterior surfaces of both lungs. The left lung is in a state of hypostatic congestion, weighs 760 grams, and is adherent to the diaphragm. The right lung is also congested, weighs 850 grams, and is adherent to the diaphragm. The liver is enlarged and weighs 2,370 grams. The upper part of the right lobe is adherent to the diaphragm. Its edges are blunt and surface dimpled. It cuts with increased resistance; is congested and full of connective tissue. The gall bladder is small; its walls thick and fibrous. It contains only a few drops of bile. The spleen weighs 250 grams and is somewhat congested. The left kidney weighs 250 grams. The right kidney weighs 230 grams. They are both light colored on section, and their capsules strip off, leaving a very slightly granular surface. The cortical portion is considerably thickened and gives the reaction for amyloid degeneration. Pancreas weighs 125 grams and is normal. Brain weighs 1,470 grams and is normal.

H. A. S.

T. B. P.

J. M. G.

CARCINOMA OF THE PANCREAS.

CASE 1.

J. C.; aged 63 years; nativity, Newfoundland; occupation, fisherman; admitted to the United States Marine Hospital, Boston, Mass., September 13, 1898; died November 7, 1898, at 2 p. m.

History.—Father, mother, and brothers died of consumption. Is a moderate drinker. Does not use tobacco. Denies venereal history. Has suffered with rheumatism at times for the past nine years; with this exception has enjoyed good health. Three weeks ago he was seized with intense itching all over; worse at night. Pruritus sometimes comes on with a cold sweat. Suffers with insomnia. Has a slight cough. Patient is very emaciated and generally debilitated. Examination of heart discloses a mitral regurgitant murmur. Radial and temporal arteries atheromatous. Pulse, 96 beats per minute. Examination of lungs showed moist râles on both sides of chest. Sputum was examined several times, but tubercle bacillus was not found. Urine examined frequently; always normal. All remedies for pruritus were exhausted without success. A 10 per cent ichthyol ointment seemed to afford longest relief. Patient scratched himself until he bled. Temperature on admission was normal, but rose to 38.6° C. the morning of the following day, and declined by lysis to 37° C. on September 29. On October 10 superficial abscesses filled with pus began to develop all over body. These were treated by free incision, irrigation, and drainage. With development of abscesses temperature rose to 39.4° C., and ranged between that point and normal, with a daily evening rise until death. On October 12 cough grew much worse, and left

lung showed physical signs of consolidation at its base. From this time on he suffered greatly with meteorism, which would disappear and recur irregularly. Abscesses increased in number until they were on every portion of his person. Dry gangrene of thumb of right hand occurred. Patient grew gradually weaker. Vomiting and diarrhea set in on November 6, and he became unconscious and died on November 7, at 2 p. m.

Necropsy (twenty-one hours after death).—Rigor mortis present; post-mortem lividity marked; body much emaciated; pupils equally dilated. Mediastinal glands greatly enlarged. Pericardial sac contained 100 c. c. of straw-colored fluid; pericardium thickened. Extensive fatty degeneration of walls of heart. A pink clot in right side of heart, and a yellow clot in the aorta. Weight of heart after opening, 300 grams. Valves of heart all thickened, and all competent, except mitral, which was thickened and incompetent. Endocardium considerably thickened. Ascending aorta dilated, and containing calcareous deposits. Abdominal aorta, iliac, and femoral arteries showed fatty degeneration. Radial artery almost occluded by clots and calcareous deposits. Bronchial glands enormously enlarged. Pleura slightly adherent. Weight of left lung, 1,030 grams; adhesions throughout: congested in lower lobe; bronchial mucous membrane thickened, infiltrated, and containing catarrhal exudate. Smaller bronchi contain pus. Weight of right lung, 1,130 grams; adhesions throughout—dense diaphragmatic adhesions; lung congested throughout: on section exudes bloody froth; bronchi like those of left lung. On opening the abdomen a large new growth was discovered, involving the omentum, mesentery, and pancreas. It was nodular and caseous in character. Abdominal glands enormously enlarged. Stomach congested at cardiac end; otherwise normal. Weight of liver, 1,350 grams. Gall bladder distended, containing 50 c. c. bile. Weight of pancreas, 150 grams; largely involved by new growth. Weight of left kidney, 175 grams; of right, 180 grams; both normal. Both suprarenals were greatly degenerated, and presented dark brown appearance on section. Weight of spleen, 250 grams, slightly congested. Membranes of brain normal. Weight of brain, 1,350 grams; white infiltration and adhesions along longitudinal sinus. Excessive fluid in subarachnoid space.

F. I.

PERITONITIS.

CASE 1.

C. A.; aged 24 years; nativity, Sweden; admitted to the United States Marine Hospital, Stapleton, Staten Island, N. Y., April 17, 1899; died June 17, 1899.

History.—Family history negative. Previous history: Has had gonorrhea for past three weeks. Present history: Gonorrheal discharge at present is less in amount than it has been at any time. Three days after onset of attack of gonorrhea noticed swelling in both groins which were not painful at first but became so as swellings increased in size, and he finally had to give up work on account of these enlargements—buboes. General health since buboes have appeared has been very poor. Appetite poor; sleeps poorly; bowels regular. Glandular enlargement on left side is greater than on right side; glands are indurated and painful on pressure. Treatment: Poultices applied over buboes. April 24, anæmic. Prescription: Elixir 3 phosphates 5 c. c. t. i. d. after meals.

April 26.—Swelling on right side diminished; swelling on left side fluctuates; right bubo painted with tincture of iodine; poultices stopped. Poultices continued on left side.

April 28.—Swelling on left side larger; incised and curetted; no anæsthetic given; poultices applied over dressings.

May 3.—Wound did not do well after operation and secondary operation under ether was performed; number of glands, including deep chain, found involved; they

were enucleated and were found to be breaking down, some containing large amount of pus; bleeding vessels secured, cavity packed with iodoform gauze, and usual external dressings applied.

May 8.—Doing fairly well; wound has been fairly clean, but some of the tissue was sloughing and had to be curetted away.

May 16.—Wound clean, granulating, and has healthy appearance; dressed with iodoform gauze every second day.

May 26.—Wound healing slowly; granulations healthy; swelling on right side becoming larger and more painful; sand bag placed over right inguinal bubo.

May 29.—Wound on left side almost healed. Cavity after operation almost completely filled with granulations and skinning over. Glands on right side larger, more painful, and evidently suppurating. Operation for removal of these glands advised and done at patient's request. Etherized. Removed all the superficial and most of the deep glands in right inguinal region found enlarged, broken down, and suppurating. Wound partially closed by five interrupted silkworm gut sutures. Cavity packed with iodoform gauze and usual outer dressings applied.

May 30.—Temperature 37° C. Bowels moved; general condition not very good.

June 2.—Wound dressed; slight purulent discharge on dressing; wound irrigated with solution of bichloride of mercury 1:5000; two stitches removed; right side of scrotum swollen, tender, and painful; epididymis swollen and thickened; applied ointment ichthyol 20 per cent over scrotum and put scrotum in suspensory bandage; wound of operation on left side entirely healed.

June 6.—Dressed wound and found it quite clean; swelling and inflammation in right epididymis subsiding; remaining stitches removed.

June 8.—Appetite very poor; wound clean and granulating, dressed. Given bitter tonic to improve appetite; inflammatory swelling in scrotum all gone.

June 14.—Doing fairly well; wound clean and granulating; complains of pain in abdomen. Put on milk diet and given powder in morning of calomel 0.3 gram and soda bicarbonate 0.5 gram.

June 15.—Pains in abdomen became worse yesterday afternoon; temperature rose to 41.1° C.; pulse 128, wiry; respiration 32, shallow and entirely thoracic; abdomen was tense, tender, and slightly tympanitic; kept thighs flexed to relieve pain; vomited several times during afternoon and a number of times during night, vomiting becoming bilious along toward morning. Bowels moved freely during night, and hot applications kept applied to abdomen relieved pain somewhat; wound dressed last evening and found clean; abdomen just above wound and along inguinal canal very tender and painful. This morning general condition poor; face pinched and expression that of peritonitis; temperature 37.8° C.; pulse 120 and small; respiration 32 and shallow; abdomen tender, tense, and tympanitic, these symptoms being especially marked on right side: no dullness. Bowels active all morning. Wound dressed and found clean; hot turpentine stupes applied over abdomen, and given another dose of calomel. Prescription: *Spirits frumenti* 20 c. c. every two hours; no improvement noticed during day; given enema of soapsuds at 6 p. m.; bowels moved freely after enema; vomited this evening.

June 16.—Given hypodermic of morphine sulphate 0.014 at 9 p. m. and he slept several hours after receiving it; bowels moved freely during night; no vomiting since last evening; temperature 38.2° C.; pulse 130 and feeble. Prescription: *Spiritus vini gallici* 20 c. c. every two hours, and *strychnia sulphate* 0.002 every two hours. Abdomen flat and not so tender or tense.

June 17.—Condition grew worse, temperature remained high; pulse rapid and thready; respiration rapid and shallow. Gradually became exhausted and died at 9 p. m., June 17, 1899.

Necropsy (fourteen hours after death).—In deference to wishes of relatives only abdomen opened and its contents examined. Body that of a male about 30 years of age; emaciated; no marks of violence; slight suggillations in dependent por-

tions of body. No fat on incision. Peritoneum thick and congested. Omentum thick, congested, and adherent to peritoneum and intestines by recently formed lymph. Liver covered by large amount of recent lymph. Peritoneal cavity contained 100 c. c. yellowish fluid. Intestines covered by large amount of recent lymph bands throughout entire length which break easily. Extensive adhesions between intestines and parietal peritoneum. Intestines in dependent portion covered with large amount of lymph which is more marked on right side and easily peels off; in spots have firmer adhesions than is generally found over rest of intestines. Left kidney: Normal in position; capsule nonadherent; weight 225 grams; marked fatty degeneration in cortex; demarcation very distinct except at center, where one pyramid is almost replaced by fat. Spleen: Position normal; size, large; covered by recently formed lymph; weight 285 grams; congestion marked. Liver: Covered with lymph, particularly under surface; weight 2,940 grams; large cut sections have nutmeg appearance; fatty degeneration, especially right lobe. Bladder: Peritoneal surface covered with inflammatory deposit. Right kidney: Position normal; capsule nonadherent; weight 225 grams. Demarcations (between cortex and medulla) distinct, except at center, where they are obliterated. Fatty degeneration of cortex marked. Stomach: Large and small intestine congested and external surfaces covered with recently formed lymph. Pancreas: Anæmic and fatty.

J. M. K.

G. W. S.

CASE 2.

J. H.; aged 45 years; nativity, Norway; admitted to the United States Marine Hospital, Cleveland, Ohio, August 27, 1898; died August 30, 1898.

History.—Patient stated on entering the hospital that he had been drinking heavily all summer, and for the week before admission exceptionally hard. Two days before admission, while quite drunk, he was thrown from a box car and kicked in the abdomen; forty-eight hours later he was found alongside the railroad track and sent to the hospital. When brought here his pulse was very weak and he was much exhausted. Later, persistent vomiting and diarrhea set in and he was unable to retain any nourishment whatever. Hiccough followed and failed to yield to the various remedies. Examination of the abdomen revealed diffused tenderness, most marked below the umbilicus. Heart very weak; no murmurs detected.

Necropsy (twelve hours after death).—Emaciation was not great and rigor mortis not present; pupils moderately dilated; lividity marked in dependent portions. The pleuræ were almost obliterated by old adhesions. The left lung weighed 635 grams; presented evidence of a marked hypostatic congestion in lower lobe. The right lung weighed 635 grams; also showed hypostatic congestion, but less marked than in the left lung. Pericardium negative. Heart weighed 355 grams; ante-mortem clot in right ventricle; dark clot in left ventricle; valves all competent. Peritoneal cavity contained a large quantity of sero-purulent fluid, and the intestines were glued together. The greater part of the membrane was intensely inflamed and covered with a deposit of fibrin. Stomach was greatly congested; the mucous membrane was covered with a thick tenacious mucus mixed with extravasated blood. The small and large intestines were much inflamed throughout. Liver weighed 2,040 grams; peritoneal covering inflamed. The parenchyma showed evidence of an acute febrile process. Gall bladder contained about 40 c. c. of bile. The pancreas was somewhat congested. The right kidney weighed 162 grams; the left, 180 grams; both were apparently normal. Bladder somewhat congested. Urethra and prostate normal. Spleen weighed 170 grams; capsule wrinkled and adherent; parenchyma somewhat softer than normal. Brain weighed 1,520 grams; membranes normal, with the exception of several small caseous deposits along longitudinal fissure.

H. W. W.

CHRONIC NEPHRITIS.

CASE 1.

J. M.; aged 33 years; nativity, Scotland; admitted to United States Marine Hospital, Boston, Mass., February 20; died May 8, 1899.

History.—Family history negative. Previous history: Has never had rheumatism; has used both tobacco and alcohol, but not to excess; had gonorrhea and chancre some time ago. Present illness: Contracted a cold three weeks ago; had shortness of breath and attacks of vomiting; on admission complained of a catching pain under heart, with labored respiration; bowels open and regular; pulse, full, tense, bounding and frequent; cardiac action tumultuous: tongue pale and swollen; skin pallid; carotids strongly pulsating. Treatment: Magnesium sulphate, saturated solution, 40 c. c. at once.

February 21.—Urine analysis; Sp. gr., 1.024; reaction acid; color, reddish brown; albumen present; sugar absent: casts, large hyaline, granular, and epithelial; epithelium, vesical and tubal; crystals, uric acid, calcium oxalate, and sodium urate; blood examination, leucocytes present. Patient died on the afternoon of May 8, 1899.

Necropsy (eighteen hours after death).—The body was that of a medium-sized male. External appearance: Face cyanosed and œdematous; ascites and œdema of the extremities marked; general nourishment of the body fair: pupils, right dilated, left not dilated, but showed beginning cataract; heart, color pale; weight, after opening, 600 grams; aortic and mitral valves incompetent; tricuspid and pulmonary competent; cavities about normal; walls thickened; pericardial sac had sclerotic patches on its inner surface: sac contained 300 c. c. of dark reddish fluid; arch and thoracic aorta dilated and contained atheromatous patches, also a few calcareous deposits. The ductus arteriosus was pervious and about the size of a lead pencil; nares, trachea, and larynx appeared to be normal. Lungs: Marked congestion in both; left, weight 650 grams; right, 700 grams; pleural cavities contained each 600 c. c. of fluid; pleuritic adhesions at base of right lung. The gastro-intestinal tract appeared to be normal. Stomach filled with a dark watery fluid. Abdominal cavity contained 300 c. c. of light-brown colored fluid. Liver: Weight, 1,520 grams; color pale; on section typical nutmeg appearance: cirrhosis marked; gall bladder and ducts appeared to be normal; omentum atrophied. Pancreas: Weight, 70 grams. Kidneys: Left, weight 235; right, 200 grams: both large and pale; capsules peeled off rather easily. Cortex, thin; parenchymatous inflammation in both. Pelvis and ureters normal. Bladder very much dilated and filled with dark urine; walls thin. Deep stricture of urethra. Prostate slightly enlarged. Suprarenal bodies each weighed 8 grams. Spleen, weight 160 grams. Scalp, skull, brain and its membranes appeared to be normal. Brain: Weight, 1,400 grams. An increased amount of fluid in cranial cavity. Spinal cord and nerves not examined.

F. I.

CASE 2.

E. D.; aged 42; nativity, New York; admitted to United States Marine Hospital, Baltimore, Md., October 22, 1898; died May 27, 1899.

History.—On admission complained of pain in back, shortness of breath, and weakness on prolonged exertion. Lower limbs were œdematous: heart's action labored, heart much enlarged, though no valvular disease was made out. Lungs gave no abnormal physical signs, but breathing was very rapid. Urine showed specific gravity of 1.022, and contained abundant granular and blood casts. Patient was put to bed, kept on milk diet, and given infusion of digitalis. Bowels were freely opened by epsom salts and skin kept active by hot baths. His condition improved enough for him to sit up during the day, and the pain ceased. He then had several relapses, succeeded by temporary improvement. He lost weight

rapidly, though his appetite remained good. The action of the skin became very defective, in spite of pilocarpine and other remedies. Faculties were alert, except for occasional drowsy spells. Urine, voided to amount of 2,000 c. c. daily, continued to give large amounts of albumen and numerous casts. He steadily grew weaker; the oedema increased, and death was preceded ten days by semicoma.

Necropsy (fourteen hours after death).—Body, 5 feet 10 inches in length; probable weight, 175 pounds; fairly well nourished, but very oedematous, pitting deeply on pressure; cadaveric rigidity present; body deeply discolored on dependent portions. Brain and membranes: Weight, 1,510 grams; dura much thickened, and rough to the touch; vessels sclerotic and filled with dark blood; opaque patches of lymph seen on pia mater; on section of pia a pale yellow fluid ran from the incision; ventricles of brain filled with serum; brain substance normal, except slight congestion. Thorax: On incising skin over sternum a clear fluid exuded. Heart: Weight, 880 grams, walls flabby; pericardium slightly rough on serous surfaces and contains 600 c. c. of straw-colored fluid; visceral pericardium shows large white fibrous patches over the ventricles; valves competent; right ventricle contains large dark clot; papillary muscles and columnæ carneæ enlarged; walls of the ventricle soft; left ventricle and auricles enlarged and soft, but otherwise normal; coronary arteries sclerotic; veins of the heart congested; aorta rough on interior; valves competent; a considerable deposit of fat near the base of the heart, and muscular tissue of heart shows serous infiltration on incision. Lungs: Both pleural cavities filled with serum, which escaped on opening thorax and was not estimated; right lung, weight, 655 grams; left lung, weight, 580 grams: both lungs are compressed and sodden, occupying the upper part of the pleural cavities; they are deeply congested and on section a dark bloody fluid exudes. Abdomen: Contains about 2,500 c. c. of serum; omentum represented by a few adipose shreds; intestines pale and empty; a line of dark knob-like projections are observed along the longitudinal muscular band of the transverse and descending colon. Liver: Weight, 1,330 grams; congested, giving out dark thin bloody fluid on section. Gall bladder distended with 60 c. c. of thin bile. Spleen: Weight, 280 grams; congested; soft in consistence. Stomach not examined. Kidneys: Right, weight 170 grams; left kidney, weight, 180 grams; capsule peels easily from both kidneys; cortical substance is pale and pyramids congested, giving a hard fibrous sensation to the touch; there are deposits of fat around the pelvis of each kidney, and a watery fluid escapes on section of the organ. Other organs not examined.

F. E. W.

G. P.

CHRONIC NEPHRITIS.

CASE 3.

J. L. (white); age, 55 years; native of Scotland; admitted to the United States Marine Hospital, Boston, Mass., March 6, and died April 27, 1899, at 6.40 a. m.

Summary of history of case.—He had influenza about two months ago and about the same time he began to have convulsions which lasted about one-half hour each. They came on suddenly and without premonitory symptoms. He had three before coming to the hospital. He suffered from shortness of breath. Had to get up three or four times each night to urinate and always passed very pale urine. Suffered from frontal headache constantly, but worse at night. He had pains over heart. He had rheumatic fever twenty years ago. Has had malarial fever several times. Urine analysis showed albumen and epithelial cells, crystals of uric acid, triple phosphate and oxalate of lime, amorphous deposits and granular detritus.

Treatment: Liq. ferri ammo. acetatis, teaspoonful t. i. d.

March 15 he complained of headache and dizziness. He was then given a hot bath, followed by hot lemonade and confined to bed. March 21 he became unconscious, respiration noisy, inspiration short, expiration prolonged. Whistling and sonorous rales over both lungs, pulse full and tense. Heart sounds intensified. Gave morph. sulph. with atrophia. Later on gave pilocarpine 0.015. Hot lemonade was given frequently and hot baths daily. About a week ago he began to have convulsions almost daily, and they also increased in severity. He had a very severe convulsion night of the 25th. and from that he did not regain consciousness. Death occurred at 6.40 a. m., April 27, 1899.

*Necropsy (four hours and forty minutes after death).—*Body of medium size male, not disfigured by scars or otherwise. Post-mortem lividity present. Rigor mortis present. General nourishment fair. Pupils: Right was obscured by a cataract, left normal. Heart weighed 515 grams; aortic and mitral valves thickened, but competent; tricuspid competent; left and right ventricular walls slightly hypertrophied; pericardium appeared to be normal. Left lung weighed 460 grams, the right 565 grams; there was some congestion in apex of right lung; both lungs contained considerable black pigment; there were adhesions of the pleuræ, especially over right lung. With the exception of these adhesions the pleural cavities appeared to be normal. The mucous membrane of the stomach was slightly congested. The rest of the gastro-intestinal tract appeared to be normal, also the peritoneum. Liver slightly contracted, color normal, weight 1,250 grams. Gall bladder normal size and filled with dark bile; ducts pervious and appeared to be normal. Kidneys: Left and right weighed 100 grams each; capsules adherent; cortical portion almost obliterated; on the cortex were several cysts about the size of a small hazelnut, which contained dark watery fluid. The bladder, urethra, and ureters appeared to be normal. Spleen slightly contracted, weight 135 grams. Suprarenal capsules weighed 10 grams each. Pancreas, weight, 120 grams. Brain, weight, 1,470 grams. Its membranes were slightly œdematous. Spinal cord not examined. The abdominal and thoracic aorta had spots of fatty degeneration of the intima.

F. I.

CASE 4.

L. L.; aged 36 years; nativity, Norway; was admitted to the United States Marine Hospital, San Francisco, Cal., January 18, and died January 23, 1899.

History.—The patient was under treatment for contusion of the face and hemorrhage of the nose, with clots of horribly fetid odor. He was discharged and readmitted January 23, 1899, for Bright's disease. The patient was generally in a stupor and would not talk, therefore no definite history of his kidney disease could be obtained. His face was œdematous about the eyes and his complexion sallow. The respirations were deep and stertorous and the pupils slightly dilated. The pulse was regular; its volume fair but not well sustained; apex beat of the heart was 2 cm. to the left of the mammary line in the fifth left interspace and the transverse diameter of the heart dullness increased. The urine had a specific gravity of 1.010, was acid in reaction, and contained a large amount of albumen and numerous granular casts. The urine and feces were passed involuntarily. Treatment consisted in the administration of tincture of digitalis to sustain the heart. Strychnine and whisky were also given for this purpose. Fluid extract of ergot was given to control the hemorrhages from the nose.

*Necropsy (twenty-five hours after death).—*The body is that of a well-developed, well-nourished, white adult male of medium size. There is some edema about the face and about the ankles. Blood is oozing from nose and mouth, and there is a spot of ecchymosis near the right eye. Rigor mortis is present. The peritoneum is normal. The intestines are slightly distended with gas. The pericardium is very thin, and the heart can be seen through its substance. It contains 10 c. c. of

fluid. The heart is smooth, the veins not congested, and it has stopped in diastole. Its cavities are all full of blood, except the left ventricle, which is empty. The valves are all competent, but the mitral has a white clot adherent to it. The heart muscle is normal in appearance, the wall of the left ventricle being somewhat thickened. It weighs 550 grams. Both lungs are adherent to the pericardium. The left lung weighs 500 grams and the right lung 660 grams. Both are crepitant. On section they exude from the bronchi a frothy material and the walls of the bronchi are congested and thickened. Both lungs are in a high state of hypostatic congestion. The spleen weighs 118 grams and is normal. The left kidney is 10 cm. long and weighs 90 grams. It is pale in color, and is closely adherent, leaving on removal a granular surface. The pyramids are in places hardly discernible. The right kidney is of the same description and weighs 95 grams. The bladder is thickened and contracted. The gall bladder contains 15 c. c. of golden yellow bile and is normal. The liver weighs 1,720 grams and is normal. The dura mater is a little thickened, but not adherent. It contains a slight excess of fluid. The brain weighs 1,370 grams and is normal.

T. B. P.

J. M. G.

CASE 5.

H. W.; aged 57 years; nativity, Virginia; colored; admitted to the United States Marine Hospital, St. Louis, Mo., October 25, 1898, and died January 22, 1899.

History.—Patient caught cold in July, 1898, at which time he had headache, vomiting, diarrhea, and swollen feet. These symptoms lasted about a month. He caught fresh cold the latter part of September, and has been sick ever since. He now has dyspnoea and coughing spells, accompanied by frothy expectoration. His appetite is poor and he has some nausea, but he has not vomited for four days; bowels costive. Physical examination: Heart hypertrophied, aortic sound accentuated, pulse 98, small, low tension: lungs full of mucous rales, respirations 28, temperature 37.4° C.; liver enlarged, some ascites present; legs oedematous. He passes 1,700 c. c. urine in twenty-four hours. Sp. gr. of urine, 1,006, color pale, about 1 per cent of albumen present. Microscopical examination shows epithelium cells, blood cells, granular casts, and oxalate of lime crystals. There is a complete oblique inguinal hernia on the right side. The patient improved under treatment, but was unable to do more than move from his bed to a chair. At times he had considerable pain in his right hypochondriac region. By the middle of December, 1898, the oedema in his legs had very much increased and his hands and face were swollen. On the 1st of January, 1899, blood was first noticed in his expectoration. He had no fever at any time. At 9 a. m. on January 22, 1899, he suddenly became worse, his breathing was harsh and noisy, loud mucous râles were present over both lungs, and he had a severe pain in his right side. He died at 1 p. m. of the same day.

Necropsy (twenty-four hours after death).—Height, 159 cm.; legs oedematous; rigor mortis not well marked; hernia on right side size of a fist. Scalp loose, frontal bone 7 mm. in thickness, occipital bone 1.1 cm. in thickness; very little blood in sinuses of the dura mater. Weight of brain, 1,539 grams; length 20 cm., width 15 cm.; color, externally, white tinged with red, vessels considerably engorged; internally, color grayish white: small vessels show plainly. Right hemisphere of cerebellum has more white matter present than left hemisphere. Abdominal wall 2 cm. thick, contains very little fat. Stomach is of a yellowish white color, full of gas; intestines are of reddish gray color. Abdominal cavity contains 260 c. c. of straw-color fluid. Right pleural cavity contains 920 c. c. of reddish yellow fluid, and the pericardial sac 220 c. c. of light yellow fluid. There are 30 c. c. of dark red blood mixed with white clots in the right ventricle, and the left ventricle is filled with dark and white clotted blood. There is dark clotted blood in

the great vessels and the pulmonary artery contains a large yellowish white clot. Weight of heart, 570 grams, 9 by 10 by 8 cm.; thickness of wall of right ventricle, 1 cm.; of left ventricle, 2 cm.; valves of heart normal. Left lung: Weight, 542 grams; $22\frac{1}{2}$ by 15 by 6 cm.; adherent to diaphragm; crepitant, dark purple color, externally; internally, dark chocolate color; on section dark blood exudes. Right lung: Weight, 850 grams; 20 by 13 by 7 cm.; adherent to diaphragm; reddish purple, externally; internally, dark red; tissue hard, easily broken with the finger; blood and serum exuding when torn. Spleen very difficult to extract on account of adhesions; weight 150 grams; 9 by $6\frac{1}{2}$ cm.; hard, brittle; internal substance easily broken up; color dark red. Left suprarenal capsule 5 cm. in its greatest diameter; internally, orange color. Left kidney: Weight, 230 grams; 11 by 8 by 4 cm.; cortical substance $1\frac{1}{2}$ cm. thick, yellowish white color, the yellow color running down between the pyramids; thickness between pyramids 8 mm.; base of pyramids indistinct; apices of pyramids dark red color. Right suprarenal capsule $3\frac{1}{2}$ cm. in diameter. Right kidney: Weight, 70 grams; 7 by 5 by 2 cm.; yellow cortical substance extends between pyramids, but cortical substance at periphery has entirely disappeared; pyramids small and indistinct. Stomach: Length, 21 cm., greatest diameter 11 cm., contains yellowish gray fluid; mucous membrane slate color, spotted with red. Small and large intestines in good condition; no adhesions between walls of intestines inclosed in hernial sac. Liver: Weight, 1,360 grams; 23 by 16 by 8 cm.; on section some blood exudes; tissue of a uniform chocolate color. Gall bladder contains 30 c. c. of dark green bile.

W. G. S.

CASE 6.

O. W. F., aged 60 years; admitted to United States Marine Hospital, Boston, Mass., March 25, 1899; died April 3, 1899.

History.—Smokes and drinks in moderation; denies venereal infection. Family history good. In 1883 he was treated at the Massachusetts General Hospital for Bright's disease; his statements as to his previous condition are very indefinite. His present illness began twenty days ago. The urine, which is diminished in amount, scalds him when it is passed. His abdomen, feet, legs, and face are swollen. The legs pit on pressure. The heart is hypertrophied, the apex displaced to the left.

March 26.—Marked dyspnœa, prolonged expiration, moist râles over posterior portions of both lungs, pulse feeble, legs swollen and cedematous.

March 27.—Condition unchanged.

March 28.—Daily hot baths, followed by pilocarpine hypodermically, produce a free perspiration which makes him feel more comfortable. Respiration very much distressed.

March 29.—Œdema of both legs diminished. Bowels constipated.

April 1.—Dyspnœa increased. Respiration very noisy. Does not suffer any pain.

April 3.—Patient passed a very bad night. Vomited during the night. Death occurred at 11.20 a. m., April 3, 1899.

Necropsy (two hours and forty minutes after death).—Post-mortem rigidity present in the head and arms, but absent in the legs. Post-mortem lividity present. Both legs swollen considerably, and pit on pressure. The pericardium contained 1,000 c. c. of fluid. The heart was enlarged. The left ventricle hypertrophied. The thickness of walls 3 cm. The right ventricular wall was very thin, measuring only 1 cm. in thickness. The ventricular cavity appeared to be rather large. The aortic and pulmonary valves were normal. The mitral valve was somewhat thickened. The tricuspid valve was normal. The aorta presented yellowish, thickened patches of fatty degeneration; especially marked in the abdominal portion. When the heart was removed from the body a great deal of fluid blood escaped from the venæ cavæ and aorta. The heart contained a few white clots, and the commence-

ment of the aorta and pulmonary artery contained large red clots. The heart weighed 400 grams. The left lung weighed 1,250 grams. It contained a great deal of pigment, which was distributed in patches, especially noticeable upon the surface. The pleura appeared to be normal. Upon section, the lung was found to be œdematous. The right lung weighed 1,250 grams. The posterior portion of the lung was consolidated. This consolidated area was surrounded by a congested area. The anterior half of the lung, including the apex, was free, but some fluid was present in the tissue. The pleura covering the lower lobe, middle lobe, and lower portion of the upper lobe was inflamed, and upon its surface a fibrinous exudate had formed, but the adhesion of the visceral to the parietal pleura was readily broken. The peritoneal cavity contained 1,000 c. c. of fluid. The liver weighed 2,300 grams. The capsule covering the lower border of the right lobe anteriorly was considerably thickened. Otherwise the liver appeared to be normal. The gall bladder contained about 50 c. c. of bile. The gall ducts were pervious. The pancreas weighed 60 grams. It appeared to be normal. The left kidney weighed 300 grams. It was enlarged, and upon section was found to be very pale. The capsule peeled off easily. The division between cortex and medulla was not apparent. The right kidney weighed 300 grams. It was swollen and pale like the left. The ureters appeared to be normal. The bladder was very small. It contained about 50 c. c. of urine. The walls measured about 2 cm. in thickness. The mucous membrane was thickened and thrown into numerous folds. The prostate weighed 70 grams. It was larger than normal. The spleen was normal. It weighed 220 grams. In places the capsule was opaque and thickened. The omental vessels were congested. The brain and cord were not examined. Death was due to Bright's disease and hypostatic pneumonia.

F. I.

CASE 7.

J. S. (colored); aged 43 years; nativity, Kentucky; admitted to the United States Marine Hospital, Evansville, Ind., January 27, 1899; died March 17, 1899.

History.—On admission he complained of shortness of breath and pain in his breast. An examination disclosed a faint cardiac murmur, heard with first sound of heart. Legs were œdematous, lungs congested, and there was a large amount of albumen in the urine. Efforts were made to relieve the kidneys and strengthen the heart. He had several attacks of cardiac palpitation. His condition grew worse and he died at 2.30 p. m. March 17, 1899.

Necropsy (twenty hours after death).—General nutrition was good, rigor mortis well marked, pupils dilated. Brain and meninges were normal; brain weighed 1,305 grams. Heart dilated and flabby. Right ventricle was much dilated. Valves were normal except aortic, which had a few calcareous patches on them near the edges. A few patches of calcareous matter were also noticed on the walls of the ascending aorta. Weight of heart after opening, 557 grams. Lungs were congested, otherwise normal. Weight of right lung, 985 grams. Weight of left lung, 735 grams. Liver weighed 1,940 grams, congested, otherwise normal. Pancreas: Weight, 105 grams; normal. Spleen: Weight, 220 grams, congested, otherwise normal. Right kidney: Weight, 195 grams. Left kidney: Weight, 210 grams. Both kidneys were larger than normal and were congested. Cortical layers of both were thin. Other organs and tissues were normal.

J. H. O.

CASE 8.

D. McG. (colored); aged 50 years; nativity, Kentucky; admitted to United States Marine Hospital, Evansville, Ind., March 2, 1899; died March 13, 1899.

History.—On admission the patient was in a serious condition. His respiration was hurried and the pulse was rapid and weak. The lower extremities were œdematous. The urine was found to be loaded with albumen. A cardiac aortic

obstruction murmur was heard. Bowels were loose. Treatment was directed toward relieving the kidneys and to strengthening the heart. He could not lie down, but occupied an invalid's chair all the time. He gradually failed, and died at 6.45 a. m. March 13, 1899.

Necropsy (three hours after death).—Rigor mortis slight. Pupils dilated. General nourishment of patient good. Tissues were cedematous. Brain and meninges normal. Brain weighed 1,280 grams. Heart was hypertrophied. Weight after opening, 565 grams. Calcareous deposits were found on all the valves and on wall of ascending aorta. More calcareous deposits were on the aortic valves than on the others. No abnormal amount of pericardial fluid. The lungs and pleura were normal. Some little fluid in both pleural cavities. A few adhesions were found at apex of left lung. They were congested slightly. Right lung weighed 505 grams. Left lung, 435 grams. Liver weighed 2,055 grams, presented a mottled appearance (nutmeg liver), congested. Pancreas normal; weight, 85 grams. Spleen small and tough; weight, 61 grams. Left kidney weighed 255 grams. Right kidney weighed 185 grams. Both kidneys were enlarged, the left one more so than the right one. They presented signs of parenchymatous degeneration. Part of the descending colon and a large portion of the small intestine made up a hernia into the scrotum on the left side. Other organs and tissues were normal.

J. H. O.

CASE 9.

P. L.; aged 50 years; nativity, Ireland; admitted to United States Marine Hospital, Baltimore, Md., January 3, 1899; died January 29, 1899.

History.—Previous history negative, except that he had been a drinking man. When admitted to the hospital he had a cough, sore throat, and pain in his limbs, all of which began about three months previous, when he got wet. Temperature 38.8; pulse, 84. Passes small amount of urine frequently day and night. Urine of low specific gravity, acid, and contains albumen and granular and hyaline casts. Heart enlarged, arteries sclerotic, and limbs slightly cedematous; vomits frequently after eating. Bowels inactive. Was put to bed, given milk diet, and infusion of digitalis administered in increasing doses to full limit. Also given a hot bath once daily. Condition improved slightly at first, but soon became more serious. Skin and bowels were inactive in spite of pilocarpine and purgatives. Vomiting became frequent, and amount of urine decreased rapidly. Enemata were used, and 500 c. c. of normal salt solution injected hypodermically twice a day. Patient sunk into coma, interrupted by mild delirium, and terminating in death.

Necropsy (fifteen hours after death).—Body emaciated; rigor mortis marked, cadaveric lividity slightly shown. Brain exposed; membranes highly congested; brain substance of cortex moderately congested; ventricles contain small amount of straw-colored fluid; nuclei apparently normal. Chest opened; pericardium normal; contains 10 c. c. of yellow fluid. All chambers of the heart enlarged and all contain white clots, which extend into the great vessels. Coronary arteries sclerotic. Aortic valves calcareous; other valves normal. Heart weighs 630 grams. Lungs mottled gray in color; pleurae slightly adherent on both sides. Lungs on section show marked congestion. Abdomen opened; viscera in general appearance normal; small amount of peritoneal fluid. Stomach and intestines present no abnormalities on being opened and examined. Liver normal in size, slightly cirrhotic on section. Pancreas normal. Spleen normal. Kidneys large, right weighing 330 grams and having connective tissue much increased at expense of cells. In upper end of right kidney was a globular abscess containing about 10 c. c. of pus. Left kidney enlarged and sclerotic. Bladder thickened and collapsed.

S. R. T.
G. P.

CASE 10.

Bright's disease.

H. J.: aged 45; Englishman by birth; admitted to St. Mary's Infirmary, port of Galveston, Tex., January 24, 1899; died February 1, 1899.

History.—Complained of shortness of breath, frequent micturition, and swelling of legs. Patient had been exposed to much rough weather and had been a hard drinker all his life. From November 18 to November 30, 1898, he was treated in the marine wards for rheumatic fever. From the date of dismissal to January 1, 1899, he felt well; after that his breathing got progressively worse, and he had to get up very frequently at night (about six times) to pass water. Admitted that he had been taking laudanum. Physical examination: Pupils contracted by opium; is emaciated; skin muddy yellow; breath and body have a urinous odor; heart considerably enlarged, but there is no murmur; urine is almost solid with albumen; casts not found. He appeared to improve slightly under heart tonics and diuretics, but for a day or two before he died was evidently sinking. He died quietly on February 1, 1899.

Necropsy (sixteen hours after death).—Height, 5 feet 3 inches; girth at nipples, 30½ inches; at umbilicus, 27 inches; purpuric spots on outer aspect of right forearm; lividity and rigidity marked. Small, round superficial scars on legs above ankles; no glandular enlargement or other signs of syphilis. There is abundant subcutaneous fat—the skin, subcutaneous fat, and abdominal fat being of a dirty ochre-yellow color. There is about 45 c. c. of fluid in the pelvis, with flakes of pale-yellow coagulated lymph. The vermiform appendix hangs free in the pelvis; the gall bladder is slightly distended. Heart: The heart is adherent throughout to the pericardium, the adhesions being recent and imperfectly organized; the right and left ventricles are both distended with decolorized clot and fluid, watery blood; the left auricle is full of decolorized clot; the right auricle is distended with dark blood clot; the aortic valve is competent; the pulmonary valve is incompetent from dilatation of the pulmonary artery, and while the aortic valve has the usual number of segments, the pulmonary valve has two segments only; all the valves are free from vegetations; the heart is much hypertrophied and the right ventricle is dilated; the right ventricle measures 3 mm. (one-eighth inch) at its thickest part; the left ventricle 18 mm. (three-fourths inch). Lungs: Both lungs are very oedematous, the lower lobes showing also much hypostatic congestion. Spleen: The spleen is slightly indurated, but otherwise seems normal. Kidneys: Both kidneys are in an exactly similar condition, the right being 10 cm. long and weighing 73 grams, and the left 7.5 cm. long and weighing 67 grams. The surface of each is very irregular; the capsule being stripped, carries kidney substance with it. The cortex is barely 3 mm. thick.

Microscopic examination.—Only the kidneys were examined. The entire section examined is the seat of a diffused and well-developed fibrosis, and the vessel walls are decidedly thickened; many of the tubules contain tube casts. Here and there are to be seen special areas of vascular fullness, and in a few places blood corpuscles are found within the tubules. Both in the cortical and in the medullary portion of the section, particularly in the former, there are tubules widely distended, containing more or less granular and fatty debris and degenerated cells. The lining of these distended tubules is a single layer of columnar epithelium, the cells for the most part very granular and showing pigmented nuclei or without nuclei. In many places these distended tubules lie close to each other, and the gradual destruction of their contiguous walls may be made out. In some positions tubular structures occur filled up with masses of deeply stained and evidently young epithelial cells, as if active epithelial proliferation were going on. The interpretation which should be put upon the condition seems to be that there

exists here a primary fibrosis, which, from the special involvement of the blood vessels, is probably syphilitic in character. This fibrosis has caused constrictions of tubules in certain places without urinary accumulation; on the distal side distension and microscopic cystic formation has resulted, and in some instances contiguous tubules have coalesced by destruction of the intervening walls. In places the tubular epithelium has rapidly proliferated under the same influence which has caused the connective tissue overgrowth; this mass of epithelium has subsequently undergone fatty degeneration, and cysts with cheesy and milky contents have resulted. In other situations the cysts contain a clear fluid. Such structural changes readily account for the functional failure and resulting fatal termination of the case.

W. K.

CASE 11.

H. L.; aged 45 years; nativity, Germany; was admitted to the United States Marine Hospital, San Francisco, Cal., November 10, and died November 27, 1898.

History.—Family history good. Patient had a chancre sixteen years ago, and gonorrhea fourteen years ago; otherwise had always had good health. Present illness began eight months ago. At that time patient caught cold, and had been gradually failing ever since. Patient complained of shortness of breath on lying down, and sometimes suffered greatly from dyspnoea. Said he also got short of breath on slight exertion. Had no pain in chest, but complained of pain in lower abdominal region on taking a deep breath or on sudden movement. His legs swelled in the afternoons, but on lying down the swelling disappears. Oedema was sometimes noted about the eyes. He complained of great thirst nearly all the time. He had distress after eating, but no vomiting nor cough nor noticeable expectoration. Had to get up three or four times during the night to pass urine, and also passed it three or four times during the day. Bowels constipated. Had lost 20 pound in weight. Patient well developed and well nourished; slightly pallid in complexion; thorax well formed. The subclavian and brachial arteries could plainly be seen to pulsate, and were tortuous in course. The heart was found considerably enlarged, principally toward the right and downward, and the apex beat seen and felt in the epigastrium. With the systole of the heart a thrill could also be felt in this region. On auscultation a murmur was heard with the first sound of the heart, continuous with the second sound. The murmur could be heard in the left axillary line. At the aortic valve area the murmur was heard with the first sound with an accentuation of the second sound. At the pulmonary area no murmur could be heard, but the second sound was accentuated. On deep pressure in the epigastric region the heart could be felt distinctly, the systole creating a thrill. Legs oedematous and pit on pressure about the ankles very deeply. The urine showed large amount of albumen. November 24 patient was found to be suffering from dyspnoea greatly, and a pleuritic effusion was determined. Left thorax was aspirated, and about 100 c. c. of fluid obtained, affording considerable temporary relief. Patient was placed on milk diet and given tincture of digitalis and Basham's mixture three times a day. When necessary compound jalap powder was given to move the bowels. On November 24 he was given fluid extract of pilocarpus 0.66 c. c. three times a day. Patient died November 27, at 9 a. m.

Necropsy (five hours after death).—Body that of a well-developed, well-nourished adult white male. On the right arm is the figure of a star and a barrel in blue ink; on the left forearm a cross of blue surrounded by a red halo. The connective tissue throughout the body is very oedematous, that of the legs being excessively so. Fat of the abdomen is quite thick. The omentum is normal. The peritoneal cavity contains about 500 c. c. of straw-yellow clear fluid. The peritoneum is shining, clear, and to all appearances normal. The right pleural

cavity is filled with a straw-yellow clear fluid, which wells out on making incision. The parietal pleura is shining, smooth, but a little thickened. The pleura over the lung is smooth and glistening. The lung itself is collapsed, filling only one-half of its cavity. It is carnified and in contact with the posterior thoracic wall. Fluid wells up between pleuritic adhesions in the left pleural cavity. The pericardium is very much thickened, opaque, and contains 30 c. c. of a clear straw-yellow fluid. The heart is very large and almost fills the pericardial sac. The coronary veins are enormously distended. The heart is hard and firm, yet cuts with about normal resistance. Right auricle is filled with both ante and post mortem clots. The right ventricle is filled with fluid blood and a few coagula. The left auricle contains a little dark fluid blood. The left ventricle contains a little fluid blood and some small clots. Heart weighs 630 grams. The aortic valves stand the hydrostatic test, as do also the pulmonary valves. Both auriculo-ventricular valves are found to be competent, and the openings on each side will admit the tips of three fingers. The walls of the left ventricle are very much hypertrophied, smooth, and no sclerosis is found in any of the heart valves. On cross section the right bronchus exudes a thick, purulent, yellow matter. The right lung is much shrunk but crepitant. The bronchial lymph glands are enlarged and black, but not caseous. Larger bronchi in the lung exude yellow, purulent matter on section, and their walls are thickened and show signs of engorgement. Left lung is bound to the chest wall in many places by adhesions. It is somewhat congested on section, but shows no sign of acute organic disease, and is crepitant. The right lung weighs 470 grams and the left one 600 grams. The brain weighs 1,370 grams. The dura mater presents on its superior median surface a number of small white opalescent bodies about the size of a grain of wheat. These are soft and easily crushed in the fingers.

The spleen weighs 150 grams. Its surface is smooth and glistening and its capsule peels easily and smoothly. On section it is found slightly congested and the malpighian bodies can be seen. The left kidney has its fatty capsule well developed. It is rather small and of hard texture, cutting with considerable resistance. Its capsule is rather adherent and on peeling leaves a granular surface. Granules are red, while the intervening tissue is much lighter. The cortex is pale and very thin. The malpighian pyramids are very pale. The pelvis is normal; weight, 100 grams. The right kidney is small, hard, granular, and in the same general condition as the left; weight is 110 grams. Pancreas normal. Gall bladder is normal in size and filled with a brownish-green, opalescent, viscid fluid. Gall ducts normal. Externally the liver is normal. On section it is much congested, but presents a few light-colored areas. The intestines and stomach are normal, with the exception of the appendix vermiformis, which was obliterated and its site bound down by adhesions. The bladder and prostate are normal.

T. B. P.
J. M. G.

CASE 12.

J. B.: aged 35; a native of Maryland, was admitted to the United States Marine Hospital, New Orleans, La., December 6, 1897; died October 4, 1898.

History.—Had rheumatism ten weeks four years before admission. Had a bad cold contracted three weeks previous to his admission. There is now dyspnoea, slight cough, and frothy expectoration. Considerable oedema of legs. Given 10 minims tr. digitalis every three hours. Urine acid; specific gravity 1.021; contained much albumen. There was anasarca and ascites and congestion of lungs. Amount of urine 1,500 c. c. Heart hypertrophied. Apex impulse 5 cm. below and 5 cm. to the left of nipple in sixth intercostal space (whether patient prone or erect). Over auricle is a soft murmur of a galloping character, systolic in time, apparently no aortic or tricuspid murmurs. Under treatment the amount of albumen

in the urine is diminished and edema diminished. Bowels loose. At first amount of urine diminished, but increased with diuretics. He was discharged March 28, 1898, improved. He was readmitted May 2, 1898, in the following condition: There was urgent dyspnoea, general anasarca, and ascites. The second toe of right foot was gangrenous. The terminal phalanx was exposed and there were maggots in the sloughing tissue. Vision bad. Passed 900 c. c. of urine in 24 hours. This contained a large amount of albumen. He was given 15 c. c. infusion digitalis t. d. The amount of urine increased to 1,100 c. c. in twenty-four hours.

May 11.—He was tapped and 18 liters of fluid removed from his abdomen. Patient made more comfortable.

June 3.—Ascitic fluid slowly increasing.

June 29.—Tapped abdomen and withdrew 16 liters of fluid. In the evening he complained of soreness in abdomen and felt weak.

July 16.—Removed 14 liters of fluid from abdomen.

August 2.—Removed 12 liters from abdomen.

August 10.—Removed 13 liters of fluid from the abdomen. Patient breathed easier. Slept fairly well. Complained of slight pain in his right leg.

August 18.—Sediment of urine contained granular and hyaline casts, blood cells, and single epithelial cells.

August 25.—Abdomen distended with fluid so as to interfere with respiration. Twelve liters of fluid withdrawn. Patient feels easier.

September 6.—Removed 10 liters from abdomen.

September 18.—Abdomen distended with fluid so as to cause urgent dyspnoea.

September 20.—Eight liters of ascitic fluid removed.

September 21.—Had symptoms of collapse. Pulse very weak and rapid. A profuse perspiration, cold, bathed his face and body. He had m. xxx of whisky and 0.002 of strychnia hypodermically. The injection of whisky was repeated. He was packed with hot-water bottles. Prescription: Tinct. digitalis, 4; spts. frumenti, 100 c. c. Sig., 10 c. c. every 6 hours.

September 26.—Urgent dyspnoea. Abscess below popliteal space of right leg. When incised a considerable amount of pus escaped. The thigh was much swollen and tender. The solution of digitalis and whisky was given every three hours with 0.001 of strychnia sulphate.

September 28.—Feels fairly comfortable; has no pain; is a little restless; had bacon for breakfast, and wants chicken for dinner.

October 1.—Slept well, feels fairly well, but ate no breakfast.

October 4.—Seems very weak, but is free from pain. Takes very little nourishment. He is much weaker; pulse weak. Stimulation seems of no avail. His feet and legs, also hands, are cold and moist; respiration jerky. The amount of urine passed is also very small, not more than 400 c. c. This contains $1\frac{1}{2}$ per cent of albumin, estimated as dry albumin. He died at 6.40 p. m.

Neeropsy.—Body that of a man about 1.75 m. tall and would have weighed about 68 kilograms, but his body was much emaciated. He had several scars on his left leg, just above the ankle joint; abscess on calf of right leg; several cupping scars on the abdomen, which was much distended. On section about 2,500 c. c. serous fluid escaped from the abdominal cavity. Five hundred c. c. from each pleural cavity, and 500 c. c. from the pericardium. The intestines were much distended and covered with flocculi of lymph, and adhered in solid mass. The peritoneum covering the intestines and abdominal cavity was of a gray color. Liver: The upper and under surfaces were covered by a false membrane of recent formation. The liver was pale in color, normal consistency, and on section was readily divisible into lobules by the staining of the bile ducts with retained bile. It weighed 1,505 grams. The spleen was firmer than normal, and on the exterior surface were five cicatrices extending about 3 mm. into the substance. Weight, 425 grams. The kidneys were smaller than normal. Capsule adherent and much thickened.

On removal of the capsule irregular elevations of an interstitial nephritis markedly apparent. Weight of left kidney, 180 grams. Weight of right, 140 grams. Section of the kidney showed the cortical portion very much diminished and macroscopically fatty degenerated. Between and beyond the pyramids only a yellow mass could be detected macroscopically. The pancreas diminished in size; firmer than normal; weighs 60 grams. Suprarenal capsules larger than normal and firmer, each weighing 7 grams. The heart much larger than normal. The enlargement seemed to affect the substance of the heart rather than the orifices, as all orifices were of normal size and the valves efficient. Patches of atheromatous degeneration in the right and left ventricles. Weight of heart, 695 grams. Aorta showed many patches of atheromatous degeneration upon which were occasional deposits of fibrin. The lungs were normal. They crepitate in every part. Posterior parts of both lungs hypostatically congested. Weight of left lung, 470 grams; right lung, 535 grams. The bladder was empty and in a normal condition. The cranium was not opened.

C. T. P.

CASE 13.

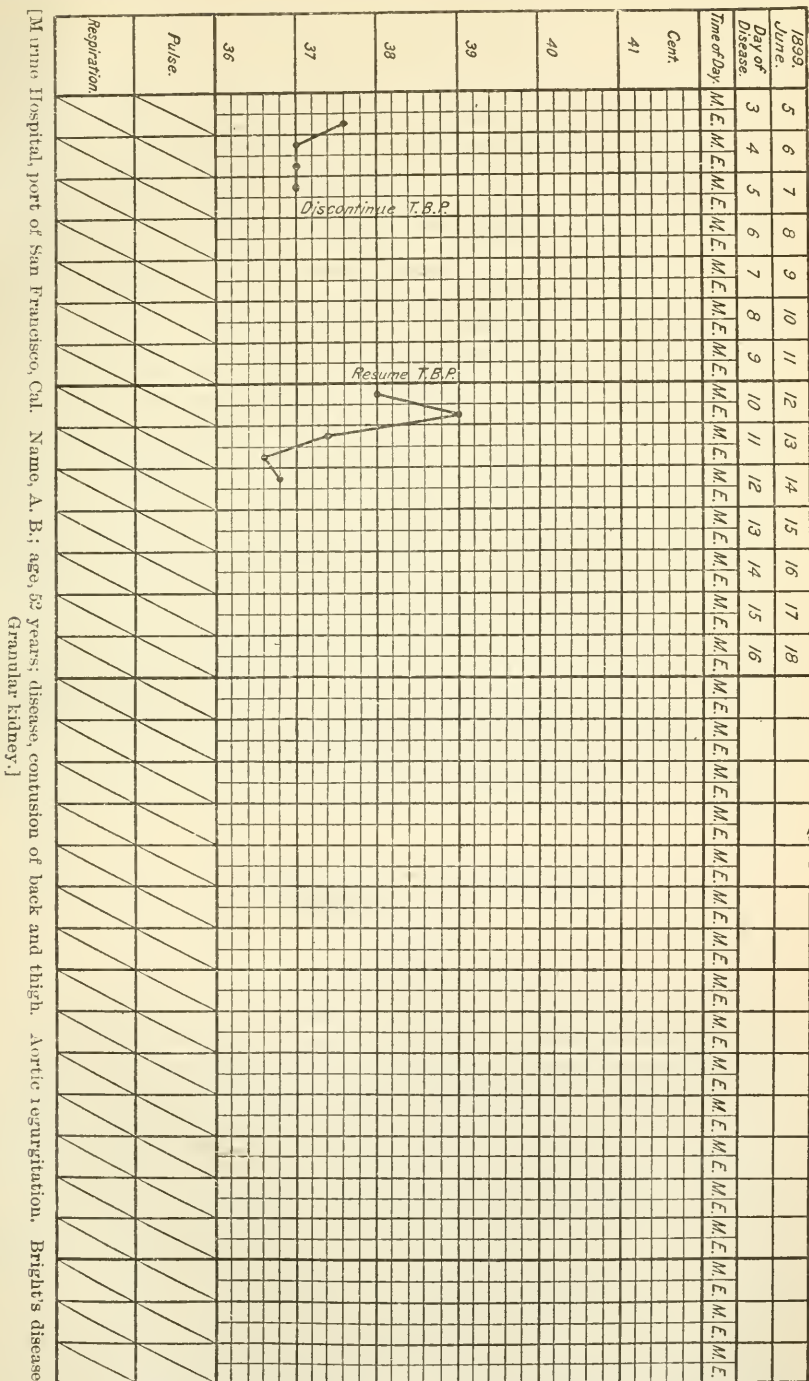
Aortic regurgitation; accidental contusions.

A. B.; aged 52 years; nativity, Nicaragua; was admitted to the United States Marine Hospital, port of San Francisco, Cal., June 5, and died June 14, 1899.

History.—On the evening of June 3, while crossing the gang plank to go ashore, the patient fell between the vessel and the wharf, striking on the log fender and bruising his left side and left leg. He received no treatment until June 5, when he was admitted to this hospital. There was some discoloration on the outer aspect of the left thigh, which was also somewhat swollen and painful. There was also a bruised area on the left side, just below the lower border of the ribs. The bruised parts were rubbed frequently with soap liniment and the patient kept in bed. On June 14, at about 11.30 a. m., the patient was seized with a fainting spell. The pulse was found very rapid and small, and the heart sounds very feeble. Earlier, at about 9 a. m., he had manifested similar, but much less pronounced symptoms. The patient complained of precordial pain during the attack. At 11.30 a. m. he was given aromatic spirits of ammonia, and apparently rallied, but some hours later another attack of "heart failure" supervened, which proved fatal before the physician summoned could reach his bedside. Death occurred at 3.30 p. m. June 14, 1899.

Necropsy (nineteen hours after death).—The body is that of a well-developed, well-nourished, middle-aged mulatto male. Rigor mortis is present. The omentum is normal. The stomach and intestines are distended with gas. The left pleural sac contains about 250 c. c. of a clear straw-colored fluid. At the apex, and also throughout the entire posterior surface of the left lung, there are apparently fresh, easily broken adhesions. At the apex of the right lung there are adhesions of a firmer character. Between the pericardium and the lower lobe of the left lung there are adhesions composed of soft membranous substance. The external surface of the pericardium shows injected vessels and the remains of yellow fibrinous adhesions at point of contact with the lung. The inner surface of the pericardium is smooth, and shows evidences throughout of small extravasations. The heart exhibits a moderate amount of fat. The coronary vessels are prominent, tortuous, rigid, and in places the walls are calcareous. The right auricle is distended to an unusual degree. The left auricle is apparently empty. On opening the right ventricle a moderate-sized dark-red clot is found. The right auricle contains a dark clot, weighing 76 grams. The left ventricle is contracted, and contains a small amount of fluid blood. The left auricle contains a small amount of clotted blood. The heart weighs 435 grams. The tricuspid orifice

admits three fingers; the valve is normal. The mitral orifice admits two fingers.



The valve is apparently normal. The walls of the left ventricle is thickened. The

aortic semilunar valves present marked calcareous flakes, interfering to a certain extent with competency. The aorta presents evidence of atheroma, especially in the neighborhood of the coronary arteries. The coronary arteries are markedly dilated. The pulmonary semilunar valves are normal. The left lung weighs 725 grams. The external surface is covered with a thick, yellow, fibrinous, easily broken exudate. On section the lung is oedematous, and toward the apex presents a pale, mottled appearance, suggesting catarrhal pneumonia. The lung is crepitant throughout. The right lung weighs 400 grams, is somewhat emphysematous along its anterior border, but otherwise normal. The spleen weighs 77 grams, is small, of firm consistence, and comparatively bloodless. The capsule has a peculiar, metallic luster. The left kidney weighs 105 grams; is contracted; the surface is irregular and nodular; the consistence is firm; the capsule is slightly adherent; the pelvis contains some fat; the blood vessels are thickened; the cortex is diminished, and the kidney pale in color. The right kidney resembles the left, and in addition has a small subcapsular cyst. The weight of the right kidney is 98 grams. The liver weighs 1,370 grams and is apparently normal. The gall bladder is distended with bile. The calvarium is unusually thick. The external surface of the dura mater is somewhat redder than normal and presents a harsh feeling to the touch. The vessels of the dura mater are prominent and their walls are thickened. On opening the superior longitudinal sinus it is found distended and completely filled by a dark clot. The inner surface of the dura mater is somewhat reddened. The vessels of the pia mater covering the convexity of the brain are distended with dark-red clots. On removing the brain a considerable amount of clear fluid is found in the posterior fossa. The dura mater covering the base of the skull presents the same appearance as that already described. The brain weighs 1,340 grams: on opening the lateral ventricles a slightly excessive amount of clear serous fluid is found. The vessels of the choroid plexus are enlarged. The choroid plexus is slightly cystic in appearance. The cerebral substance is moist and of a softer consistency than normal. The puncta vasculosa are prominent. The walls of the cerebral vessels are thickened, particularly at the base of the brain. Careful examination of the other portion of the brain shows nothing abnormal.

T. B. P.
W. J. L.
J. M. G.

PSOAS ABSCESS.

CASE 1.

Tubercle of lung.

M. R.; aged 28; nativity, New York; admitted to the United States Marine Hospital, Chicago, Ill., May 11, 1897; died August 18, 1898.

History.—Family history negative. Patient's general health up to present illness had been good. Present trouble started in 1892 when patient complained of severe pain in back, groin, and left hip joint. On examination a large psoas abscess was found on the left side, and evidences of tubercular disease in the lungs. The abscess was aspirated several times, withdrawing from 1,000 c. c. to 3,000 c. c. of tubercular pus each time. He gradually grew worse. Seven days before death a severe diarrhea started, which could not be controlled, and the patient died from exhaustion. The treatment throughout was supporting and symptomatic. Morphina was used daily to relieve the pain.

Necropsy (fourteen hours after death).—Post-mortem rigidity slight. Post-mortem congestion slight posteriorly. The skull cap and sinuses were normal. Vessels were a little dilated and full. Dura was normal. Along either side of the

longitudinal fissure a number of small tubercular deposits were found. Brain weighed 1,240 grams and was normal on section. Thymus gland was normal. Heart weighed 260 grams, pale and in systole. Valves were normal. Pericardium contained about 50 c. c. of pale fluid, and was normal. Left lung weighed 730 grams. At the apex a small cavity was found, about 25 c. c. capacity. Numerous cheesy tubercular deposits were seen throughout the upper lobe. Right lung weighed 720 grams. The lobes were bound together by adhesions. A cavity about 50 c. c. capacity was found in apex. The entire upper lobe was studded with tubercular deposits. Pleuræ were strongly adherent on both sides, and both lungs were bound down. Great vessels were normal. Diaphragm was bound by adhesion on pleural side, and has a few small tubercular deposits. Omentum small and thin, contained no fat, and was adherent to the abdominal wall along its inferior border. Spleen weighed 210 grams. External surface was studded with small tubercles. Capsule was adherent. On section a number of cheesy deposits were found about 1 cm. in diameter. Right kidney weighed 190 grams; external surface showed numerous tubercles; capsule was adherent. Pelvis devoid of fat; cortex, thin. Left kidney weighed 190 grams; was covered with small tubercles. On section the medulla and cortex were filled with cheesy deposits. The suprarenal capsules were normal. Urinary bladder contained about 100 c. c. of urine. Walls were thickened. No evidences of tubercular disease could be found. The organs of generation were normal, except left testicle, which was atrophied. The rectum, duodenum, and stomach were normal. Gall ducts and bladder normal, the latter containing about 25 c. c. of bile. Liver weighed 2,480 grams and was bound down by adhesions. External surface had a few small tubercles. It was very hard on section and looked amyloid. Pancreas was normal. Mesentery was thin and small. Mesenteric glands were tubercular. The small and large intestines were studded with tubercles and could not be examined well on account of the large number of adhesions. Great vessels were normal. The left hip joint was opened. A large cavity was found extending upward as far as the last dorsal vertebra. It contained a large quantity of tubercular pus. The acetabulum was entirely destroyed. Head of femur was partially gone, and articulated with the ilium about 6 cm. posterior to where the acetabulum was.

H. C. R.

H. W. S.

CONCUSSION OF THE BRAIN.

CASE 1.

Cerebral hemorrhage.

P. J. O'D.; aged 35 years; nativity, Ireland; was admitted to the United States Marine Hospital, San Francisco, Cal., December 5, and died December 9, 1898.

History.—Patient states that for fourteen days previous to entering the hospital he had been troubled with incessant headache in the frontal region. He could not see well, objects having a blurred appearance to him. During this time he was able to retain very little food in his stomach, as he would vomit immediately after eating. He had no chills, but said he had fever and sweats at night. He had vomited frequently, but this and all other symptoms had been growing better. He had pain in no other part than head. The patient was noticed to be dull and apathetic, but could walk, move, and talk well. The tongue was heavily coated with a white fur. The patient was placed in bed—head elevated, hair cut short, and ice bag applied continuously. A stimulating enema of turpentine and soap-suds was administered and ergot ordered hypodermatically. The patient showed no change until the morning of December 9. He then passed into a comatose condition, from which he did not arouse. The pupils were equal in size, but both

and heaving, twelve to the minute. The pulse was soft, slow, and regular, sixty-four to the minute. Patient died at 11.55 a. m., December 9, 1898.

Necropsy (four hours after death).—The body is that of a well-developed, well-nourished adult white male of medium size. Rigor mortis slight. There are no distinguishing marks on the body. The peritoneum is normal. The intestines are very slightly distended with gas. The arch of the diaphragm is on a level with the fifth costal cartilage. The pericardium shows a small amount of fat on its anterior surface; is shining and tough; its inner side is smooth and normal. The heart veins are slightly congested. Heart weight, 347 grams. On section normal. The left lung is crepitant, light, and well distended. It presents no evidence of disease; weight, 300 grams. In the right lung an area of tubercular infiltration is found in the superior lobe about the size of a hen's egg. It is otherwise normal and weighs 177 grams. Stomach and intestines normal: Pancreas normal, weight, 110 grams. Spleen: Weight, 129 grams. Left kidney, 177; right, 172 grams in weight; both normal. The liver is slightly congested; on section exudes a small quantity of liquid blood. Weight, 1,600 grams. Bladder distended with urine, but its walls are not diseased. The pericranium is normal, with the exception of a small, dry, superficial abrasion 1 cm. in diameter on the left frontal region. The vault of the cranium is normal on the exterior surface. In removing the calvarium blood is seen to exude from the cut as soon as the skull is entered. A large, firm blood clot is immediately under the covering membranes and lying on the surface of the brain. This clot covers the entire middle lobe, the posterior one-half of the anterior and the anterior one-half of the posterior lobe. It adhered to the membranes quite firmly. The surface of the brain under the clot is depressed, the depression being in its deepest part over the middle cerebral lobe 5 cm. The weight of the clot is 45 grams. The brain substance is normal. Its weight is 1,360 grams. The vessels on the surface of the cerebrum are distended with blood. There are several bead-like gelatinous cysts attached to the choroid plexus in both lateral ventricles. The hemorrhage appears to have come from a rupture in a branch of the middle meningeal artery.

T. B. P.

J. M. G.

CASE 2.

Rupture of lateral sinus.

T. J.; aged 34; nativity, Germany; admitted to St. Joseph's Infirmary June 8, 1899; died June 10, 1899.

History.—Patient left his vessel at Charleston and endeavored to steal his passage on a mixed freight and passenger train to Savannah. Being frightened by the conductor, he jumped off the top of a car while the train was passing over a trestle. This took place at midnight, and he was admitted to the infirmary at noon the next day. Condition on admission: Patient was unconscious. Pulse 58, rather soft. Temperature, 39. Respiration slow and labored. There was great swelling, contusion, and discoloration around the left eye and left side of face. Eyeball itself was not injured. Pupils were equal and responded to light. Right eye normal, except for slight puffiness of the lid. Simple fracture of the lower jaw on both sides. Tongue much swollen and bleeding in places. No evidences of fracture of the skull could be discovered. Treatment: Barton bandage to hold fragments of jaw in place. Cold compresses to left eye. Calomel in fractional doses until 0.6 gram was taken. Vomited once during the day.

June 9.—Irritable, but no paralysis. No pupil symptoms. Took seven wine-glasses of milk.

June 10.—Patient still unconscious. No pupil symptoms, but dark effusion appeared under both eyes. No paralysis. Ice cap to head. Temperature went

steadily up until 4.30 p. m., when he died, with the thermometer showing 41.6 in axilla.

Necropsy (fifteen minutes after death).—Body very muscular and in good condition. Beginning post-mortem lividity; no rigor mortis. Pupils equal and midway between contraction and dilatation. Heart weighed 230 grams, and with the other parts of the circulatory system was in all respects normal. Pericardial sac contained about 60 c. c. of straw-colored fluid. The nose was full of clotted blood. Left lung weighed 710 grams, and was bound down with a few fibrous adhesions and had but two lobes. Right lung weighed 550 grams. Both lungs were very much congested at the base. Peritoneum, gastrointestinal tract, and all the abdominal organs were normal. Liver weighed 1,710 grams (gall bladder was full of bile, but the duct was patulous); pancreas, 80 grams; left kidney, 150 grams; right kidney, 140 grams. Bladder was almost empty. Spleen weighed 120 grams; no abnormality on section. Scalp was bruised on the left side. No fracture of skull was found. When the dura was opened a large quantity of dark blood poured out. The pia showed evidences of great venous congestion. The entire brain weighed 1,330 grams. On section numerous small petechial hemorrhages were found scattered throughout the brain substance. One clot of blood the size of a bean was found on the left side of the brain just outside of the fibers of the corona radiata. The lateral ventricles were filled with bloody serum. There was a rupture of the lateral sinus on the left side which had given rise to the venous hemorrhage under the dura. The cause of death was undoubtedly concussion of the brain, but it is rather remarkable that so great a quantity of blood as was found under the dura should give no pressure symptoms.

M. H. F.

RUPTURE OF THE LIVER.

CASE 1.

H. C.; aged 28; nativity, Virginia; admitted to St. Vincent de Paul Hospital, Norfolk, Va., September 4, 1898; died September 8, 1898.

History.—Claimed perfect health before accident. Temperature, 38.5 C. Contusion of right side between ribs and crest of ilium, and right elbow, caused by blow from hawser, which parted while towing a barge. Patient complained of great pain and tenderness on pressure over abdomen, mainly on right side. Abdominal muscles were very rigid, the right rectus being held principally "on guard." Abdomen somewhat swollen, but not tympanitic. Ice was applied over seat of injury, but was removed, as it rather increased the pain. Codeine was exhibited to relieve pain. There was some nausea. Next day patient grew worse and showed symptoms of peritonitis. Pain and tenderness increased. Distension of abdomen greater. Percussion showed dullness over right side of abdomen. Nausea increased until vomiting was uncontrollable. Ice coil was applied, but, increasing pain, was substituted by hot applications, but with little effect. Bowels were moved by salines, and enemata and heart stimulants and codeine given hypodermically. Efforts were made to keep patient nourished, as far as possible, without irritating the stomach. His complexion became very yellow before death, which occurred on September 8 at 3 a. m. Diagnosis of peritonitis, with probable rupture of liver, was made.

Necropsy (nine hours and thirty minutes after death).—Rigor mortis well marked. Patient well nourished. Post-mortem ecchymosis. Large ecchymosis over seat of injury. Abdomen distended. Pericardium contained serous fluid in slightly increased quantity. Heart normal. Both pleuræ showed recent adhesions to diaphragm. Right lung showed pneumonia in lower lobe. Upper and middle lobes oedematous. Left lung congested. Peritoneum matted together and contained a large quantity of pus, principal part of which was in smaller

cavity. Under surface of diaphragm adherent to liver and stomach. Pus was very yellow, probably due to admixture of bile. Liver considerably enlarged, firm. Posterior border of right lobe showed a rupture 6 cm. in length and perpendicular in direction. Color of liver dark. Consistency very firm. Hypertrophic cirrhosis. Gall bladder normal. Stomach normal. Spleen normal. Kidneys normal, except that the right was slightly enlarged. Pancreas large, firm, and resistant on section. Intestines bruised and congested. Bladder and prostate gland normal.

E. E. F.

CARCINOMA, SQUAMOUS.

CASE 1.

C. S. (colored); aged 29 years; nativity, Louisiana; admitted to the United States Marine Hospital at St. Louis, Mo., August 24, 1898, and died January 10, 1899.

History.—The patient when a child was severely burned on the posterior part of his left leg. He had syphilis fifteen years ago. Five years ago a lump, the size of a hen's egg, was excised from the popliteal space of his left leg at this hospital. The wound healed well, but every winter afterwards an ulcer would appear in the cicatrix of the old wound. Last winter this ulcer grew to be very large, and when only partially healed, in May, 1898, he left the United States Marine Hospital in Memphis, Tenn., where he had been staying. He was able to do very little work, and when he applied for treatment at this hospital the ulcer was 24 cm. long, and at its widest part 13 cm. broad. It included the lower fourth of the thigh, the popliteal space, and the upper third of the leg. The whole ulcer was a mass of granulations, forming large-irregular lumps which extended above the skin. The surface was of a deep red color, and was bathed with a foul-smelling fluid. There was a large cicatrix on the posterior part of the thigh extending from its upper third to the ulcer. The glands above and below Poupart's ligament on the left side were enlarged and indurated. An examination of the chest showed that there was slight dullness over the apices of both lungs and the vocal fremitus was increased over the same areas. The heart, liver, and spleen were in normal condition. The ulcer was very painful and had to be frequently dressed on account of the foul-smelling fluid which exuded from it. It did not improve any under treatment, and on September 28, 1898, he was given an anæsthetic, the large lumps on the upper third of the ulcer shaved level with the skin, the wound thoroughly cleaned, and seven skin grafts applied. The grafts failed to grow, and on October 18 nine more skin grafts were planted. The patient in the meantime was growing weaker every day. He frequently had diarrhea, and would eat very little. His ulcer was exceedingly painful, and he begged to have his leg amputated. As it was evident he would soon die if left in that condition, on the 2d of November he was given an anæsthetic and his leg amputated at the junction of the upper and middle thirds of the thigh. When the operation was performed, it was the intention to remove the enlarged glands about Poupart's ligament, but after the amputation was over, the patient, although he had lost very little blood, was in too weak condition to continue the anæsthetic. He improved wonderfully after the operation; his appetite returned, he gained in weight, and was free from pain. The wound caused by the amputation healed in about three weeks. During the latter part of November, 1898, he complained of pain in his right side, and he had a slight cough. An examination of the lungs revealed mucous râles and friction sounds at the base of the right lung, with dullness on percussion. A portion of the ulcer had been sent to Washington, and word was received from the Bureau that it was a typical epithelioma. Paracentesis of the right pleural cavity was performed on December 19, 1898, and 1,850 c. c. of reddish fluid was withdrawn.

The same operation was performed a week later and 500 c. c. removed. On January 3, 1899, 850 c. c. of fluid was drawn off. During the last operation the patient was so weak the operation had to be stopped when the above quantity of fluid had been taken away. During December an indolent ulcer was formed in the left groin by the breaking down of the enlarged glands. The patient died from exhaustion at 3 p. m., January 10, 1899.

Necropsy (twenty hours after death).—Body: Large frame, emaciated; height, 186 cm.; left leg has been amputated at middle third of thigh; the wound from the amputation has entirely healed; an indolent ulcer 7 by $2\frac{1}{2}$ cm. in upper part of the anterior surface of the same thigh. Thickness of abdominal wall, 1 cm.; very small quantity of fat present; stomach and intestines grayish-white color and filled with gas. The sternum detached with difficulty from the right pleura. This pleura found to be very much thickened, of a glistening white color, and adherent to wall of chest and pericardium. It is extremely hard and offers great resistance to the knife. A section through this glistening pleura shows the center to be of softer consistency and yellowish color. Twenty-five c. c. of fluid in pericardial sac. Right and left ventricles of heart contained dark red fluid blood. Great vessels contained whitish blood clots. Weight of heart, 290 grams; measurements, 10 by 9 by 7 cm. Thickness of wall of right ventricle, 5 mm.; of left ventricle, 2 cm. Large leaf of mitral valve feels rough and gritty to touch near apex. Base of leaflets of aortic valves are roughened. Left lung: Weight, 560 grams; 22 by 13 by 5 cm.; bound down throughout by adhesions to chest wall and diaphragm. Tissue is of a purple color mottled with scarlet, soft but not crepitant on pressure. The whole lung is found to be infiltrated with hard nodules, some as large as a marble. On section these nodules are seen to be of a glistening white color with grayish centers. Right lung: Bound down by thickened pleura throughout, so as to render extraction impossible. A small portion of this lung was cut away and the tissue ascertained to be in the same condition as the opposite lung. The right pleura is as thickened behind as in front and numerous partitions extend between its walls, dividing the pleural cavity into a number of spaces containing serous fluid. Spleen: Weight, 215 grams; 10 by 8 by $3\frac{1}{2}$ cm.; of a slate color externally, internally of a reddish-brown color. Left kidney: Weight, 225 grams; 14 by 8 by $3\frac{1}{2}$ cm.; width of cortical portion, 1 cm.; apex of pyramids of a white color, base of pyramids and cortical substance of a grayish-white color tinged with red. Right kidney: Weight, 235 grams; 14 by 8 by 5 cm.; only apex of pyramids can be discerned; the rest of the pyramidal and cortical portions of same color, reddish gray. Difficult to say where pyramidal substance ends and cortical substance begins. Cortical substance apparently $1\frac{1}{4}$ cm. in thickness. Stomach: 27 cm. long, 11 cm. at greatest diameter; contains 25 c. c. of yellowish fluid; mucous membrane of a yellowish-white color. Liver: 1,755 grams; 28 by 21 by 7 cm.; cuts easily, considerable blood oozing from cut surface; color, deep red. Gall bladder contains 15 c. c. of black bile. Mesenteric glands are as large as small lima beans. Brain and its membranes not examined.

W. G. S.

Microscopical examination.—Lungs: The "glistening nodules" in the lungs were epithelial growths of the same nature as the parent tumor. Pleura: This also contained metastases. Mesenteric glands: While they were enlarged, in the specimens furnished no new growths were found. Liver: Venous congestion was very pronounced, due in all probability to obstruction of the return circulation at some point by enlarged glands. Kidneys: Bowman's capsule thickened; epithelium of the glomeruli degenerated; interstitial tissue increased, especially in the neighborhood of the glomeruli; considerable round-celled infiltration in the same regions; some of the tubules were obliterated and their places taken by a new connective

tissue; others were dilated, their epithelium apparently flattened; others were contracted: tubular epithelium generally granular. Casts were present in some of the tubes.

E. K. S.

ARSENIC POISONING.

CASE 1.

F. C.; aged 38 years; nativity, Ohio; admitted to the United States Marine Hospital, Cleveland, Ohio, March 3, 4.30 p. m.; died March 3, 1899, 7 p. m.

History.—Brought to hospital in ambulance in semiconscious condition. Patient made statement when picked up in street that he had taken a box of "rough on rats." He complained of pain in abdomen, which was apparently intense. Apomorphine, 0.006 gram, was administered hypodermically with quick result. Vomiting was free. Bowels moved with characteristic stools. The chemical antidote of freshly prepared ferric hydrate was promptly given and dose repeated every fifteen minutes. He also drank nearly a pint of milk. The heart was supported by hypodermic injections of strychnine sulphate, and just before death by aqua ammonia. Body temperature sustained by the usual methods. During the first hour and a half patient responded to treatment, but later gradually got weaker and died at 7 p. m.

Necropsy (twenty and one-half hours after death).—Height, 177 cm. Post-mortem lividity on dependent parts. Rigor mortis well marked. General nourishment good. Pupils equal. Heart (weight after opening), 382 grams. Aortic valve competent. Evidence of old endocarditis. Two segments bound together. (Right and posterior leaflets.) In them was found a calcified mass triangular $1\frac{1}{2}$ cm. each direction. Segments held out. Mitral and pulmonary valves competent. Coronaries normal. Left ventricle contracted. Right ventricle dilated. Heart stopped in systole. Pericardial sac contained 15 c. c. of serum. Lungs: Left lung weighed 550 grams; right, 620 grams. Lungs showed acute congestion. No tubercular foci. No pleural adhesions. Stomach weighed 650 grams, and showed patches of acute gastritis. Small intestine showed general acute congestion and contained considerable quantity of thin mucus. Caput coli bound down with adhesions. Liver: Weight, 1,800 grams; perihepatitis, acute congestion. Gall bladder and ducts normal. Kidneys: Left, weighed 220 grams; right, 185 grams. Slight interstitial nephritis and acute congestion present in both. Cortex three-quarters of 1 cm. Spleen, weighed 185 grams; soft, adherent to stomach, wrinkled, and acutely congested. Weight of brain, 1,500 grams. The vomitus, also contents of stomach and intestines, were subjected to Reinsch's and Fleitmann's tests with positive results.

H. W. W.

CONTRIBUTED ARTICLES.

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The following articles relating to the work of the Service have been contributed by the officers named. Included under this head, also, is an address delivered by myself before the Cincinnati Commercial Club, and an article on quarantine and sanitation written for the February, 1899, number of The Forum.

QUARANTINE AND COMMERCE.

Address by Dr. WALTER WYMAN,
Surgeon-General United States Marine-Hospital Service.

[Before the Commercial Club of Cincinnati, October 15, 1898.]

MR. PRESIDENT AND GENTLEMEN:

It was with great pleasure that I accepted your kind invitation to be present on this occasion, feeling that in coming to Cincinnati I would be but returning to a former home, where my residence of three years was one of unalloyed pleasure, and I may say profit, and I feel to-night as though I were simply returning to visit friends in a most delightful manner. Having in mind, too, the great commercial importance of this Queen City of the West and the character of your organization, I feel that the topic named for discussion this evening is a timely one, I myself having devoted a large part of the last few years to the matter of quarantine laws, the forming of quarantine regulations, and the execution thereof, while you have at heart the great question of commerce, which is so seriously affected by quarantine. Quarantine and commerce! Without commerce there would be scarcely any necessity for quarantine, and the latter assists or obstructs according as the quarantine restraints are rational or irrational.

The tremendous growth of commerce during this age of steam and electricity has made necessary greater attention to the demands of a righteous quarantine, and the intolerance of expensive delays by modern commerce demands that quarantine shall be stripped of all unnecessary, burdensome features.

In modern times he is not a properly qualified quarantine officer who does not realize that the detention of those floating communities—the merchant ships, laden with the exchange products of the earth's surface—and the interference with that great network of railroads which form our interstate commerce are matters of serious import to trade and to the functions of our national domestic life.

On the other hand, he is not a proper quarantine officer who does not realize that generally through commerce are the great contagious diseases carried to all sections of the globe and from one part of a country to another, so that if through mistaken judgment or an over-weening desire to yield to commercial interests a mistake is made and contagion allowed to spread, proceeding hand in hand with commerce in its all-pervading ramifications, not only is death and disaster brought about, but the very end which he sought to avoid—the crip-

pling of commerce—has been brought about to an increased degree that simply can not be estimated.

I am glad of this opportunity of calling public attention to the critical position in which the well-qualified and wise quarantine officer is often placed. To him are particularly applicable the words of Daniel Webster, when he said: "No one can perform his part well unless he comprehends and feels its importance and comprehends and justly appreciates all the duties belonging to it." Not only must he mean well; he must do well. Consider the position in which he is often placed. A great ship from a foreign clime, whose daily expenses may amount to thousands of dollars, is held pending the examination of a suspicious case of sickness. The agent of the vessel, the assignee of the cargo, the master and passengers are all intolerant of delay. Perhaps it is a foreign vessel, and, through the Department of State, the representatives of the foreign government are bringing pressure to bear. Almost alone he faces these conditions in the quarantine anchorage, holding the vessel there while he determines in his own mind the nature of the sickness. This situation develops a primary requirement of the modern quarantine officer. He must be well versed in the science of medicine, with special training with regard to those diseases which will become epidemic, and with which many physicians, in the course of their lifelong practice, never become familiar.

Stretched along the Atlantic and Gulf and the Pacific coasts of the United States, from Maine to the State of Washington, at 120 points of entrance to the ports of the United States, are these officers. So far are most of them removed from observation, by reason of their isolated location, that the public knows but little of their self-sacrificing, difficult, and scientific labors. I have visited a great many of these stations and observed the services of these men while being rendered, and I wish to state here that I know of no position calling for higher qualities of manhood, physical endurance, mental acuteness, judicial temperament, and firmness of purpose than is required by the position of a maritime quarantine officer.

Now, the consideration of quarantine naturally demands the division of the subject into maritime and interstate quarantine. The older of these divisions is maritime quarantine, which dates back in the history to the fifteenth century, when, by reason of the plague in the Orient, the first quarantine was established by the authorities of Venice. For forty days they confined in their lazarettos those who came from the infected domains. From that time until the present maritime quarantine has been maintained by civilized nations, with degrees of intelligence varying with the sanitary and medical intelligence of the age. The growth of medical science has brought with it improvements in quarantine administration based upon increased scientific knowledge; but, I regret to say, the improvements in quarantine administration have not always kept up with equal pace.

At the very best, quarantine is a restraint, and as such is irksome, and the day will be hailed with joy, and I believe that its breaking may even now be discerned, when our knowledge of contagious diseases, our practice with regard to municipal, maritime, and individual sanitation, will be such that quarantine will be little more than a name, requiring only the stamp of inspection, given to render assurance doubly sure as to the health of vessels and the people and cargo which they carry. But at the present time this pleasing contemplation is about on a par with the happy thought of universal peace and disarmament of nations, greatly to be desired and an ideal state; but as we can no more think at the present moment of disbanding our armies and dismantling our ships of war, no more can we at the present moment think of dispensing with quarantine.

NATIONAL MARITIME QUARANTINE SYSTEM OF THE UNITED STATES.

With regard to the national quarantine system of the United States, I believe it to be in advance, in intelligence and effectiveness, of that of any other nation. The only nation which, in the matter of importance and intelligence, can be compared with it is the English nation, and I wish here to call attention to and refute the statements which are so frequently made, sometimes by visionaries and theorists and at other times by anglomaniacs, to the effect that the English do not believe in quarantine at all, and that, in spite of their lack of quarantine restraints, the same or a greater degree of safety has been assured as has resulted from the more strenuous efforts of other countries. Not to dwell too long upon this topic, I will simply refer to the discussion thereof in the British Medical Association, which, for the first time in its history, met at a point outside of England, namely, at Montreal, last fall. By special invitation I joined in the discussion there with regard to the relative merits of the quarantine systems of England, Canada, and the United States. It was shown that the quarantine procedures of Canada were practically the same as those of this country. It was agreed by the English physicians who were present that in all essential particulars the practice of quarantine in Canada and the United States was that of the English, and that the differences in details are due to the different conditions regarding territory, coast line, and exposure.

From the paper which I read at that meeting I quote as follows, remarking upon certain peculiar conditions attaching to the United States:

First, the great number of the ports of entry and the great length of coast line, measuring, exclusive of Alaska, 5,450 statute miles, not counting the intricacies of the shore line. Then the great population, numbering in 1890 about 63,000,000, while that of the German Empire, without its dependencies, was 49,000,000; France, 38,000,000; Great Britain and Ireland, 37,000,000; Italy, 30,000,000; and Spain, 17,000,000. The areas covered by these populations are as follows: United

States, 2,970,000 square miles; German Empire, 200,000; France, 204,000; Great Britain and Ireland, 121,000; Italy, 114,000; Spain, 194,000.

Again, special conditions exist in connection with the great crowds of immigrants that daily land upon our shores. In ten years (1882-1891) more than 5,000,000 of them arrived, and in one year alone (1891) more than half a million were received.

These immigrants are from all countries, from overpopulated districts. They are mainly of the poor and ignorant class, and through their baggage, as well as themselves, subject the United States to the importation of infectious disease to a degree far in excess of the exposure of any of the nations just mentioned.

Other conditions affecting the quarantine policy of the United States are found in the great variations of climate and in the character of the commerce on different portions of our coast, by reason of which diseases much dreaded in one section give but little concern in another. There are, therefore, three geographical sections: First, the Atlantic coast north of the southern boundary of Maryland. Here arrive most of the immigrants, and our chief concern is with regard to cholera, smallpox, and typhoid fever, while yellow fever excites but little apprehension. Second, the Atlantic coast south of the southern boundary of Maryland and the Gulf coast. Here very few immigrants arrive, but on account of proximity to the Spanish Main, with its yellow-fever infected seaports, and because climatic conditions favor the propagation of yellow fever, if introduced, that disease is the chief concern. Third, the Pacific coast. Here there is some immigration from China, and guard must be kept against yellow fever from South America, smallpox, cholera, and the plague from the Orient.

THE BANE OF YELLOW FEVER.

Now, of the diseases mentioned above the three which give the most concern and require the greatest activity are cholera, smallpox, and yellow fever, and of these three the last, yellow fever, is the one disease which exceeds all the others in danger and importance, because we know the least of its true nature and character.

Through the summer the whole southern coast of the United States is on the qui vive lest yellow fever shall gain admittance. Ever since the settlement of this country there has been this annual dread. Of late years the visitations have been, happily, less frequent, but not so infrequent as to enable us to forget at any time the panic, the mortality, and the interference with commerce which are its invariable concomitants.

During the present century there have been only nine years in which the United States has not been visited by yellow fever. In some of these years, it is true, the visitation has been slight, but in others—notably the epidemic of 1878—the visitation has been heavy, causing a suspension of traffic, hindrance to intercourse between sections, obstruction to transportation of supplies, and consequently suffering, and finally death itself. It has been estimated that the epidemic of 1878 invaded 132 towns, caused a mortality of 15,954 persons, and that the pecuniary loss to the country was not less than \$100,000,000 in gold.

The restrictions upon maritime commerce caused by this disease are

so great that it seems incredible that they are submitted to without more complaint or that greater difficulty is not experienced in their enforcement. Though formerly yellow fever prevailed in the North, it is now recognized as menacing only the South, and accordingly, in the quarantine regulations of the United States, an imaginary line has been drawn along the southern border of Maryland and a distinction has been made in regard to vessels arriving at ports in the United States north and south of this line when they come from ports infected with yellow fever. Thus a vessel arriving from Cuba at one of the Southern ports between the 1st of April and the 1st of November, even though there has been no yellow fever on board during the voyage, must be disinfected and held from three to five days before being allowed entry; exception is made to passenger vessels constructed of iron, with immune crews, carrying only immune passengers, the vessel not lying overnight in a Cuban port. The same vessels arriving at a Northern port are disinfected only in case disease has actually appeared on board.

Even with these great restrictions upon commerce, safety is not absolute, and the question has been frequently asked of late years, "How long is this condition of affairs to be allowed to persist?"

CUBA'S UNSANITARY CONDITION.

In 1896 formal complaint was made to the Spanish Government of the sanitary condition of Habana, which permitted the persistence of yellow fever in the city and harbor. I addressed a letter to the Secretary of the Treasury, recounting the facts and making protest as a sanitary officer charged with the duty of protecting the United States. This letter was forwarded to the Secretary of State, and in turn transmitted by him to the Spanish minister in Washington, accompanied by a note of warning, for presentation to the Spanish Government, and a copy was sent to our own minister in Madrid for presentation to the Spanish Government there. The revolution which was then prevailing in Cuba furnished perhaps sufficient reason why the Spanish Government could not at once undertake a regeneration of the city and the cleansing of the harbor; yet this, I believe, they never would have done, even if there had been no rebellion, and, had there been no other reason for the waging of the war so successfully conducted during the past summer, in my opinion it would have been justified by reason of these intolerable sanitary conditions, which the Spanish Government, through its rapacity, had allowed to exist so long at the port of Habana and other ports of Cuba without amelioration. For it may be said that yellow fever is not a natural inhabitant of the United States, and that, while it may, when introduced and under favoring conditions, affect communities where proper sanitary conditions exist, still its maintenance as a prevailing disease is due to want of proper sanitation. It may spread where there is no

filth, but it is none the less a filth disease; and one of the most, if not the most, glorious results of the war will be the regeneration of the Cuban cities and the gradual extermination of this burdensome, horrible pest.

Whether under Cuban or American rule, attention doubtless will be given to the sanitary conditions in Cuban seaports, and I look for a relief in great part, though not altogether, from the quarantine restrictions upon commerce which for so long a time have been and are now in vogue. Let me explain: With American predominance in the island of Cuba there will be little or no difficulty, even before the ports and cities are placed in better sanitary condition, of this Government exercising a surveillance over vessels leaving for the coast of the United States proper. There is in contemplation already the locating of disinfecting plants in a number of Cuban ports by which vessels may be made absolutely safe before leaving these ports, and after vessels have been placed in proper sanitary condition at the port of departure the time occupied in their voyage to our coast, provided they arrive with no manifestations of disease, will be counted as the time which is now passed by the vessels while held in quarantine from three to five days on this side. But more than this, I feel confident that soon the sanitary ideas of the United States will prevail in Cuba and that sanitary engineering, sanitary plumbing, good drainage, good sewerage, and good water supply will all, under American influence, replace the sad conditions which prevail in all Cuban cities at present.

With these improved conditions there is no question in my mind that yellow fever will diminish in intensity and frequency and may be made in due time to disappear almost entirely. These results have been attained in Jamaica despite its proximity to Cuba as a source of infection, and with "Cuba Libre" liberated from the dominion of the Spaniard, whether independent or attached to the United States, it is not too much to expect that the yellow scourge will be made to almost entirely disappear; and with its disappearance from Cuba almost nine-tenths of the danger of its introduction into the United States will be removed.

One writer has said, with regard to Cuba, that as its prosperity and commerce have increased it has become the greatest nursery and camping ground of one of man's most ruthless destroyers. "Itself most seriously afflicted, it annually disseminates to other lands, as from a central hell, disease and death." The picture is a strong one, but no stronger than the truth.

We may confidently expect that President McKinley, your greatest citizen, our greatest citizen, with that warm sympathy with the wishes of the people and that earnest regard for our true welfare which has so notably characterized his Administration, will, in the formative conditions that now prevail in that beautiful island, see

that this most important subject receives the consideration which it deserves. The blessings that will result can hardly be estimated, for with such a central hell of dissemination of this disease, no matter how great the care to escape it on the part of other tropical ports, or to eliminate it if infected, they are constantly subject to infection and again to reinfection from this same pestilential center.

INTERNATIONAL SENTIMENT NECESSARY.

But with this great source removed there will be hope for other tropical ports, and it is not too much to expect that the influence of example and the beneficent results obtained will cause the governments of other centers, more remote, but still dangerous, to take radical measures, to the end that this disease, which is so peculiarly a disease of the Western Continent, shall no more exercise its ruinous sway, but become practically blotted out, leaving only to history to record the times when neglect of sanitation went hand in hand with oppression and robbery, and commerce was afflicted with a burdensome parasite. It is not pure optimism to suppose that an international sentiment may be awakened which will cause yellow fever in a given port, and the faulty sanitation which it implies, to be an opprobrium upon the government in possession of the offending port so great as not to be borne. Every nation should be held responsible for any conditions within its borders or within its dependencies which tend to propagate epidemic diseases that may be carried to other nations with which it expects to maintain a friendly commerce.

Two years ago, in Mexico, at a meeting of the Pan-American Medical Association, I called attention to this subject in an address on international responsibility with regard to infectious diseases, and from the report of the international committee upon international quarantine, submitted and adopted by that association, I quote the closing paragraph, as follows:

Sentiment does not enter into the ordinary consideration of quarantine, yet your committee can not refrain from expressing the hope that an international sentiment will be awakened with regard to sanitation of seaport cities and their harbors, so that a perpetually infected seaport will be regarded as an unnecessary menace to other countries and an intolerable obstruction to commerce, and that, yielding to this sentiment, the various governments will remove conditions which subject them to international opprobrium, that trade may go on unfettered and friendly intercourse be maintained without danger to human life.

NATIONAL MARITIME QUARANTINE.

Now, further, with regard to maritime quarantine, I suppose many of you are more or less familiar with the discussion which has been particularly active in the last few years as to whether it is properly a national or a State function, and a few words upon this subject I believe will not be out of place.

THE DEVELOPMENT OF NATIONAL QUARANTINE.

Until 1893 there was, properly speaking, no national system of quarantine. The colonies had their own quarantine regulations before the formation of the Union, and from that event to 1893 quarantine was left to the care of the State governments, and by the latter to county governments or to municipalities, as the case might be. There was, indeed, national legislation, but all the acts of Congress up to 1893 relating to quarantine specifically provided that the said national measures were in aid of the State and local authorities. Whatever opinions may have been held by members of the National Legislature, quarantine was permitted to be exercised by the States as a police function, and even in the present law, which gives national supremacy, it is provided that assistance shall be given the States or municipalities by the Government authorities, the supremacy of the latter being asserted only when the State or local authorities fail or refuse to enforce the uniform national regulations.

As a result of the old system, prior to 1893 each State had its own quarantine requirements. Different cities in the same States had different requirements. One city, in order to divert trade from its neighboring rival, would be less exacting than the latter in the inspection and treatment of infected vessels. Some cities found quarantine to be a means of considerable revenue, laying heavy charges for unnecessary inspection and perfunctory disinfection of vessels. The position of quarantine officer became extremely lucrative, and one of the principal offices to be used as a reward for political service, and as a source from which could be derived contributions for partisan purposes. No wonder, then, that this system was faulty, a burden upon commerce, and did not protect.

The great demand for uniformity of maritime quarantine procedures was formerly the chief cry of the sanitarians of the United States, both before and subsequent to the civil war. Conventions were held for the purpose of bringing about an agreement of the different States as to quarantine matters and regulations, one at Philadelphia in 1857, another at Baltimore in 1858, New York in 1859, and Boston in 1860. These conventions were then interrupted by the war. The first held after the war was at Jacksonville in 1878, the next at Philadelphia in 1885, and one was held at Montgomery, Ala., in 1889. These conventions utterly failed to effect their purpose, and it was not until Congress passed the law of 1893 that anything like uniformity of quarantine regulations was provided for the United States. But while Congress did allow, as it were, by sufferance, the State to execute quarantine measures, it never by any act abandoned or disclaimed its right to maintain quarantine under the clause of the Constitution which gives it the right to regulate commerce, and in 1893 it passed an act entitled "An act granting additional quarantine

powers and imposing additional duties upon the Marine-Hospital Service," empowering the Surgeon-General of the Marine-Hospital Service to examine all the quarantine regulations of the various States and municipalities, and if any were found to be insufficient, authorizing the Secretary of the Treasury to formulate such additional regulations as should be necessary; these regulations to be enforced by the State or municipal authorities if they will undertake to do so, but if they fail or refuse the President is authorized to execute them and to appoint or detail officers for this purpose.

THE PRESENT LAW.

This act was a great advance in the matter of national quarantine, and under its provisions regulations have been promulgated, and in several instances, where State or municipal authorities have failed to execute them, the compulsory right mentioned in the law has been enforced and the National Government has taken control.

But the law still fails to provide for a strictly national quarantine, and is faulty in a number of respects. First, the provision which requires a demonstration of inefficiency before the National Government shall take control has a fatal effect, because a demonstration of deficiency involves too much danger. Ordinarily the failure to enforce the national regulations is only demonstrated by some marked occurrence, which is dangerous in the extreme. For example, at one quarantine station, where the President has taken action under the law of 1893, the first demonstration of inefficient administration was the permitting of the landing of a large number of immigrants who had been exposed to cholera, and had actually conveyed cholera to a port on the way to the United States.

Aside from this it requires too much time, and offers opportunity for too much dispute as to whether the regulations have failed of enforcement, before under the law the President can be called upon to act. Another unfortunate feature of the present law is that the Government is obliged to aid in the execution and enforcement of such quarantine regulations as may be promulgated by the States and municipalities. Occasionally some very foolish and useless regulations are thus promulgated which it would be obvious folly to assist in executing. The law should read that if there is any assistance to be rendered it should be by the States and municipalities to the National Government, and should not compel the National Government to assist the States. The present law does not provide for the establishment of national quarantine stations at such points as may be necessary, either on the seacoast or on the Mexican and Canadian borders. It does not provide that when a vessel has been inspected by a national quarantine officer that that inspection shall be final. It does provide that if the vessel has been disinfected it may be admitted to enter any port named in the quarantine certificate, but

the number of vessels thus disinfected is comparatively few compared with those simply inspected.

At or near one of the principal seaports of the United States, the National Government, acting on request of several State and municipal authorities, has established a most complete quarantine establishment at large expense, conducted by regularly commissioned officers of the Marine-Hospital Service. The municipality thus protected has established another quarantine station nearer to the city, where it goes through the form of reinspecting, and charging for, vessels which have already been passed upon by the national officers, and there is no law to prevent this. The law is lacking also in not providing for the apprehension of vessels from Cuba, which, under the guise of fishing, are engaged in smuggling upon our Southern coasts, and while thus engaged may land infected material; and, worst of all, the national maritime quarantine law of 1893 provides no penalties for breaking the quarantine rules other than the penalty imposed upon a vessel if it sails from a foreign port without a bill of health.

INTEREST OF INTERIOR STATES IN MARITIME QUARANTINE.

The interest of the interior States in maritime quarantine is greater than may at first appear. Immigrants and other passengers, merchandise, etc., arriving at a port of entry are not altogether destined for that port. The interior States, it may be stated, are principally their destination. Why, then, should not the whole country share the expense of quarantine and relieve the vessels of the onerous quarantine charges; and why should the safety of the interior of the United States be dependent upon the conscientiousness and care of a local appointee, whose responsibility is limited to the confines of his town or his State, and who, moreover, is not a unit in the general system arranged for protection, but, as too often happens, is appointed for some political or local reason and subject to change with the changes of local politics. In justice to the State and local quarantine administrations I do not wish to imply that this is the universal rule, and I wish here to give testimony to the ability and care of many of these State and local officers, but the fact remains that the principle is faulty and the argument just mentioned has had a number of verifications in actual experience. I have been informed on very good authority that at one point of entry into the United States from a foreign country, if cases of suspected smallpox are destined through the State to other States, no attention is paid to them; they are allowed to go on. They are only taken up and held under surveillance if intending to stop in the State which is upon the border.

In illustration of the interest which the interior States have in maritime quarantine and their desire for a strictly national system, and as demonstrating that the expenses of quarantine should be met by the

whole people rather than by vessels entering the several ports, I insert here the following communication from the board of health of Michigan addressed to the Senators and Congressmen from Michigan:

STATE BOARD OF HEALTH, OFFICE OF THE SECRETARY,

Lansing, March 18, 1896.

GENTLEMEN: We, the officers of the Michigan State Board of Health, having in mind especially the protection of the citizens of Michigan from danger of contracting communicable diseases from immigrants and immigrants' baggage passing through the port at Portland, Me., to which port many immigrants bound for Michigan and beyond sometimes come, especially in winter, when the St. Lawrence River is not navigable, and understanding that it is the desire of the local and of the State health authorities of Maine that a national quarantine station be established at the port of Portland, Me., do most respectfully urge the honorable the Senators and Representatives in Congress from Michigan to use their influence to bring about this desired improvement.

We believe that a frequently changing municipal government, with its varying ideas of the expediency of making expenditures which are more largely for the protection of citizens of other parts of this country than of the citizens of Maine, is not equal to the task of the continuous maintenance of a quarantine station which shall meet the requirements for safety to the health of our people.

We believe that the interests of the whole country would be much better served if there was at Portland, Me., a quarantine station under the control of the National Government.

Again expressing a desire that you use your influence in bringing about this desired change, we remain,

Very respectfully,

FRANK WELLS, *President.*

HENRY B. BAKER, *Secretary.*

QUARANTINE A FUNCTION OF THE TREASURY DEPARTMENT.

For these reasons I have held, and still maintain, that all quarantine, particularly maritime quarantine, should be national. It is a concomitant of commerce, over which, under the Constitution, the National Government has absolute control, and it naturally belongs to that department of the Government invested with the power of regulating commerce in other respects. In other words, it is, properly speaking, the function of the Treasury Department. This Department registers, licenses, and enrolls all merchant vessels of the United States; it inspects the hulls, boilers, and machinery; it determines upon the number of passengers which may be carried, and provides for the housing and the rations of the crews; it carefully examines all the pilots upon the American vessels and determines upon granting them a license; it supervises the bringing of immigrants by these vessels from abroad; it enforces the navigation laws and aids vessels in distress by an efficient revenue-cutter service; it provides the light-houses and the buoys which mark the channels for these vessels to enter; it makes the soundings and furnishes the charts of our coast in further aid of these vessels; it provides for the care of the sick of our merchant marine. Why, then, should it relegate to a State authority or the health officer of some small port the one remaining act of surveillance over these vessels, namely, the determination

of whether they may be admitted to enter from a sanitary standpoint? Why should it leave to a local appointee, responsible only to a mayor or a governor, the power to determine whether all the people and the merchandise in these vessels, destined for all portions of the United States, shall be permitted to enter without detention, and why should it give this local officer the power to detain these vessels in quarantine?

These are some of the defects in the national quarantine law as it at present stands, which it is the aim of the Caffery bill to rectify. This bill is now before the Senate and the House, reported on favorably by both committees, but not yet acted on by either body.

INTERSTATE QUARANTINE AND YELLOW FEVER.

With regard to interstate quarantine, the law authorizes, when it is satisfactorily shown that yellow fever prevails to such an extent in any State as to endanger other States and Territories, national rules and regulations may be made, and another law requires cooperation with State and local authorities. The truth is, however, with regard to some of the epidemic diseases, particularly yellow fever, that, by the time the disease has become so extensive as to seriously threaten another State, the measures which might have been successful in suppressing it are apt to be futile. In other words, yellow fever is somewhat like a conflagration; if the first sparks are discovered the fire may be prevented from spreading, and, in fact, be put out, but if too much headway is gained there is sure to be some destruction and almost certain to be some spread.

Yellow fever is a disease which is so disastrous to commerce and so entirely disrupts the business of a town or city that in most places it is an act of temerity, almost, to proclaim it. I know that in one city, at least, it prevailed in the late fall and had been kept secret until the local medical officer declared that if the good Lord did not send a frost soon he could keep the knowledge of it back no longer. The temptation to hide the first case is very great, and it is extremely difficult to believe that a few cases of mild fever, with recovery, no more severe than an ordinary case of malarial fever, are as dangerous as a spark in a bundle of shavings. It is natural to look upon the hopeful side of affairs, and there is frequently enough of doubt as to the nature of a case to furnish an excuse to the attending physician to give the benefit of the doubt to the harmless disease and call it malaria; yet there is no doubt that occasionally well-defined cases where they are actually known are hidden, and the sooner an educated public opinion demands that every case be promptly announced and prompt action taken, the sooner will we be able to obviate an epidemic.

THE McHENRY EPIDEMIC.

What can be done when prompt notification is given can be illustrated by last summer's experience in McHenry, Miss. The yellow

fever prevailed in that town in the fall of 1897, and during the following winter a most thorough disinfection of all the houses known to have been infected was conducted, great care being exercised. However, an ice house, supposed to be such, but really filled with sawdust, which had been used during the epidemic of 1897 by people from an infected house as a latrine, escaped disinfection. In cleaning it out last summer two workmen were simultaneously stricken with yellow fever. There had been a number of cases before the disease was made known, and one or two persons who had been exposed to infection had gone to neighboring localities, where they themselves developed the disease. They were traced, however, and placed under treatment, and when recovering ordinary precautions were taken and it did not spread from these cases. All who had been exposed to infection in Mellenry were isolated, the sick were treated in tent hospitals by themselves, and thus all trace of the disease was wiped out. There were, all told, 25 cases. How the disease originated later in Louisiana and Mississippi is a matter not yet to be passed upon. It would be improper to give a decision upon this point until full official inquiry has been completed, but it is a shortsighted policy that contemplates the secretion of all knowledge of the presence of yellow fever. It is not only shortsighted, it is a cruel policy; cruel to those in the immediate neighborhood, and, on the part of State and local physicians, unjust and cruel to the people of neighboring States and localities.

If there were some means by which there could be a compulsory notification and the General Government could immediately take charge of the infected locality, it would give increased confidence, would prevent the laying of senseless quarantines, and in time people might come to regard a case of yellow fever as they do at present a case of smallpox—something to be avoided, but to be taken care of officially. Deception is practiced, because it is known that if the disease is announced the neighboring States and localities will quarantine against and ruin the business of the locality infected. On the contrary, the neighboring States and localities take this action because experience has taught them that deception is practiced until the truth can no longer be withheld. The announcement of one case of yellow fever is generally proof positive that there have been a number of cases before the announcement was made, and that the announcement is only made because the truth can be no longer withheld.

MEASURES TO PREVENT SPREAD OF YELLOW FEVER.

It is the policy of the Marine-Hospital Service, while attempting to suppress an epidemic, to prevent so far as possible unnecessary restrictions upon commerce. Therefore a classification of freight has been made. Some classes require no disinfection whatever; other classes, under certain conditions, require partial disinfection of exterior, etc.,

and other classes require absolute disinfection. With regard to passenger traffic, train inspectors are placed upon all trains running from the infected districts, with a view to preventing people leaving unless possessing a certificate to the effect that they have been in a noninfected place for the ten days immediately preceding, and a certificate for the disinfection of their baggage if from an infected locality. When a town or locality is of a size which will permit of it, a cordon of guards is thrown around it and none are allowed to leave it without passing through a camp of detention, which is made as comfortable as possible, where people may pass ten days and then be given a certificate which permits them to pass into noninfected States and localities. Experience has proven that an epidemic of yellow fever which begins early in the summer is a much more serious affair than one which begins in the fall or late summer. The worst epidemic of yellow fever known in modern times was that of 1878, when it is estimated there were over 15,000 deaths. This epidemic began in the early summer; the one of last year began in the early fall, as also did the one which is now prevailing. It will diminish with the appearance of cooler weather, and be brought to an end by the first killing frost. In explanation of the seeming spread of the disease it should be stated that in many of the places announced as being newly infected it is found that the disease has been prevalent in a mild form twenty to thirty days, thus showing that it has not spread from place to place, as is popularly supposed, but that the disease may have come to a number of places at about the same time from a common origin. Thus when A is infected and after a while B is found to be infected, and later on C, it does not follow that C has taken infection from B, but rather from A. This again emphasizes the disaster involved in the authorities of A keeping the existence of the disease a secret.

Now, gentlemen, it is time I should bring my remarks to a close. I must not forget that these matters, so absorbing to myself, may not be of equal interest to you; yet I should like, had I had time to prepare and had you the time and patience to listen, to touch upon many topics growing out of the subject presented. I should like to speak more fully concerning the quarantine law, to describe the quarantine service of the United States, national as well as State; to describe how the former has grown to twelve large stations, with their equipments of piers, warehouses, barracks, boarding steamers, hospitals, and disinfecting apparatus. I should like to describe the work of the Marine-Hospital Service, whose officers control these stations, and to tell what the corps does and how it has grown from the limited relief to the sailor when it was established in 1798 to its present proportions in this the one hundredth year of its existence, when it treats 53,000 sailors annually, conducts 20 hospitals and 120 relief stations, examines pilots, examines men for the Revenue-Cutter Service, examines crews for life-saving stations, conducts a hygienic laboratory, inspects the

immigrants, and issues public-health reports each week embodying sanitary and statistical news from all parts of the world. I might interest you with a plain narrative of its operations during the past summer and fall, when so many causes have contributed to unusual responsibility and to extension of its scope. But all this would take undue time. So in conclusion I will simply give expression to one thought which occurred to me while reflecting on the topic of the evening and while visiting, as I often do, as it is but a block from my office in Washington, that beautiful building, the Congressional Library on Capitol Hill. All Americans who visit that building are impressed with the grandeur of its architecture, its ornate exterior, and the beauty of its interior structure and decoration. The appreciation is by no means diminished by the sense of proprietorship which all may feel, and as from one of its upper balconies one takes in the views spread out before him these emotions can not but be enhanced. There is the Capitol, unsurpassed by any in the world, and from its base the broad, clean avenues, fringed with trees, extend to the Potomac, and toward their farther end rise the White House, the Treasury, the State, War, and Navy building, the Naval Observatory, and that grand monumental shaft to Washington. All this is ours, and as the eye rests upon the Virginia hills beyond, it is not difficult for the mind to go still farther south across the blue waters of the Gulf to the Gem of the Antilles, freed at last, and to Porto Rico, in three more days to be under the American flag. Then we think of Hawaii and the Philippines, and how, with all this expansion of our territory there must be expansion of our commerce. Our exultation, however, is tempered by responsibility; the commercial world has much to do to profit to the utmost by our new conditions; and as each agent of Government service seems striving to lend all possible aid to secure the full fruition of our victories, let me say to you, on behalf of the national quarantine service, that no effort will be spared to prevent our commerce being hampered by disease, for this is modern quarantine, to strip commerce of disease, both for its own good and for public safety.

QUARANTINE AND SANITATION.

By Dr. WALTER WYMAN, *Surgeon-General United States Marine-Hospital Service.*

[The Forum, February, 1899.]

It will be my purpose in this article, first, to show that sanitation receives its primary impulse from quarantine, and follows it in natural sequence, whether considered from a local, municipal, State, or national point of view, and, second, to discuss the proper field of operation to be covered by local, municipal, State, and national authority. All are doubtless familiar with the quarantining of a room wherein a case of measles or scarlet fever is confined, or of a house whose front door is placarded with a warning on account of scarlet fever, diphtheria, or smallpox. Many, also, have observed the precautions taken to prevent the spread of typhoid fever, including, under municipal regulation, not only the disinfection of dejecta, but the examination of drains and sewers and the closing of infected wells, the source of water supply, by local boards of health. The step from quarantine to sanitation here is a short one.

Now, while there are some who seem to think that these measures—affecting so closely the individual—should be supervised by a great central bureau, they are at present, and always should be, under the direct control of local or municipal governments, which are as capable to manage these matters as they are to manage their police and fire departments. The general sanitation of towns and villages, including systems of sewerage, disposal of garbage, water supply, house draining and plumbing, ventilation of school houses and other buildings, examination of the milk supply, proper disposal of the dead, enforcement of the disinfection of dwellings after the ordinary contagious diseases, such as scarlet fever and diphtheria—all these and many other functions of like character are matters with which the United States Government, under the Constitution, has nothing to do, and they properly belong to municipal governments, which derive their charters from their respective States.

Anyone consulting the annual reports of the health departments of our leading cities will be impressed with the care and labor bestowed on their work; but the operations of these departments would be better and more easily accomplished if there were a stronger sentiment of approval and indorsement by the people. Just as all governments derive their just powers from the consent of the governed, so sanitary regulations may be taken as an index of the desire of the people; and

it may almost be said that the degree of prosperity, cultivation, and refinement of any city is indicated by the care which is given to the enactment and enforcement of its sanitary regulations. This demonstrates the necessity, on the part of the people, of upholding the hands of physicians and others who are engaged in work pertaining to the public health, the suppression of contagious diseases, and the enforcement of necessary sanitary measures. It is the duty of the general practitioner, whose relations are more intimate with the people than those of the health officer, to cultivate a sentiment of respect for the efforts of the latter; for it is from the people that the sanitarians must derive their power for good. General practitioners should take an interest in the labors of these, their confrères, as well as in the formation of local boards of health, in order that good men may be appointed; and all their influence—professional, political, and social—should be given to the support of these boards and their officers. A strong public sentiment should be encouraged, to the end that municipal cleanliness may rank as one of the foremost features of municipal government.

One of the most notable events of the past decade was the review in New York City, some two or three years ago, by the mayor and other officials of the metropolis, of its neatly uniformed street cleaners—the “Waring Brigade” as they were called—organized and conducted by that eminent promoter of sanitary reform, Col. George E. Waring, jr., who recently sacrificed his life in the performance of his duties as a public sanitarian. His conduct of his army of street cleaners really marked an epoch in municipal sanitation in the United States, and the example set by him has been followed in a number of other cities, where the so-called “white wings” may now be seen at work.

STATE BOARDS OF HEALTH.

Now, there are some questions of sanitation concerning which municipal authority finds itself deficient in legal power, or as to which there is doubt regarding the expenditure of municipal funds—questions involving the relations of one municipality to another, and requiring consideration by some official body representing the authority of the State. Nearly every State, therefore, has its board of health, to act where municipal authority fails, to harmonize conflicting interests, to encourage local boards, and to exercise supervision over them, while allowing each independence of action to fulfill without restraint its local functions. The State organization is the medium through which relations are sustained with other State organizations and with the National Government. Every encouragement should be given to the development and perfection of the State boards of health, and the legislatures of the respective States should be liberal in their endowments.

To show the sequence of public health service to quarantine, it may be mentioned that the first State boards of health were organized

largely on account of the quarantine service, and only subsequently developed their other and more appropriate functions. With the development of national quarantine their quarantine functions have become less important, and with the perfection of national quarantine their maritime quarantine functions should be entirely removed. Maritime quarantine is a function of the Treasury Department of the National Government, and its exercise by State or local health organizations diverts the efforts of these bodies from what should be their essential functions. For example, until about a year ago the so-called Louisiana State board of health was little more than a quarantine board for New Orleans, with no authority whatever in the parishes of Louisiana. Divest the State boards of their maritime quarantine duties, and they will devote themselves to their legitimate ends, such as the perfection of morbidity and mortality records throughout the State, sanitary engineering, filtration of water supplies, suppression of the ordinary epidemic diseases, the development of laboratories, the suppression of quackery, the supervision of the practice of medicine, and the management of State hospitals and of State institutions for the care of the poor and the insane.

The question of smallpox in the United States is illustrative of the foregoing. It is evidently the duty of each State to suppress this disease within its borders, and most States do give it the attention it deserves; but there are other States which, either through faulty organization or because their legislatures do not appropriate the necessary funds, are powerless to suppress this disease, and since its prevalence endangers neighboring States the National Government is obliged occasionally to take charge of local epidemics. Some of the most strenuous opponents of national maritime quarantine have been certain health officers who have been utterly unable to suppress smallpox raging within their jurisdiction, and the rather remarkable situation has been developed of appeals being made by the mayors and local boards of health urging the Marine-Hospital Service to suppress smallpox in States whose health officers have been most pronounced in decrying so-called Government interference in maritime quarantine.

Smallpox is so easily prevented by vaccination that one afflicted with it meets with scant sympathy, and the improvements in the preparation of pure vaccine lymph have been so great that the fear of untoward results from vaccination is unwarranted. Further, the spread of smallpox is so easily prevented, under proper and vigorous management, that it is discreditable to any State or locality to allow the disease to get beyond control. If the inability to manage it is due to a want of funds, then this lack is discreditable to the legislative bodies of the infected States or localities. The Marine-Hospital Service has suppressed a number of local epidemics of smallpox, and is ready at all times to send expert assistance to advise in preventive measures; but operations involving the expenditure of money are undertaken only

when necessary to prevent the spread of the disease from one State to another.

The above remarks demonstrate clearly, to my mind, both the important functions of local boards of health and the necessity of developing and strengthening the State boards of health.

NATIONAL QUARANTINE AND SANITATION.

Now, maritime quarantine, as a national function, is maritime sanitation, and is intimately connected with the sanitation of seaports. It is the sanitation of ships, of merchandise, and of personal effects. In interstate quarantine it is the sanitation of common carriers, merchandise, and personal effects, and, as illustrating its intimate association with the sanitation of towns, reference may be made to post-epidemic disinfection by the Marine-Hospital Service of towns and cities in the South after the yellow-fever epidemic in Jacksonville, Fla., in 1888, in Brunswick, Ga., in 1893, and in the States of Alabama, Mississippi, and Louisiana in 1897. As a quarantine measure, too, it will be the duty of the present Government to insist on the sanitation of Habana and other Cuban cities, and, in due time, of every city in the Western Hemisphere which is known as a yellow-fever-breeding port. These matters should be and are the care of the National Government, the Marine-Hospital Service being charged with the duty of preventing, through the operations of the national quarantine law, the introduction of disease from foreign lands.

Until 1893 there was, properly speaking, no national system of quarantine. All previous legislation had required only that assistance should be given to State or local quarantines, and each State and locality had its own quarantine requirements—some good, some bad, some made strict enough to keep out disease, and others purposely weak, to attract, as it were, commerce to a more favoring port. At least half a dozen conventions were held by State health authorities, both before and after the war of the rebellion, to bring about uniformity, but all efforts failed until Congress enacted the law of 1893. This was a great advance in national quarantine, and under its provisions regulations have been promulgated; but the law requires a demonstration of inefficiency of management on the part of the local authorities before the National Government can assume control at a given port. This demonstration of inefficiency is precisely what should not be allowed. The law requires the Government to aid State and local authorities in the execution of their own regulations, which are sometimes unwise. It should require the local authorities to aid in the execution of the Government regulations. It does not provide that when the national quarantine officer has inspected a vessel such inspection shall be final, nor does it provide penalties for the infraction of the national regulations.

These are the defects which are sought to be remedied by the bill

introduced into the Senate by Mr. Caffery (S. 2680) and in the House of Representatives by Mr. Hepburn (H. R. 4363). This bill provides, also, that during yellow-fever epidemics the President may prohibit travel and traffic, except under safeguards imposed by national authority. At the same time, to obviate interference, by unreasonable local quarantines, with commerce and mail passing from one State to another, it grants authority for travel and traffic after application of the necessary sanitary measures. The bill has received the indorsement of the Secretary of the Treasury, and has been reported on favorably by the committees of the Senate and of the House, the House committee having given hearings on it extending over two or three months. With regard to maritime quarantine, the bill, which is simply an amendment to the present law, makes the national regulations paramount. Maritime quarantine is a regulation of commerce, over which, under the Constitution, the National Government has absolute control; and it naturally belongs to that department of the Government invested with the power of regulating commerce in other respects. It is a function of the Treasury Department.

The Treasury Department has charge of the registry of all merchant vessels of the United States; inspects their hulls, boilers, and machinery; determines the number of passengers that may be carried; provides for the housing and rations of the crews; examines pilots on American vessels before granting them licenses; supervises immigration; enforces navigation laws; aids vessels in distress; provides light-houses and marks the channels with buoys; makes the soundings and furnishes the charts of our coasts in further aid of vessels, and provides for the sick and injured of the merchant marine. Why, then, should it relegate to a State or local authority the sanitary inspection of a vessel on its arrival, or the power to determine whether the people and merchandise on these vessels, destined to all points in the United States, shall be permitted to enter, with or without detention?

Maritime quarantine actually begins in foreign ports. Under our present law the United States consul—a Government official—issues a bill of health. In times of danger medical officers of the Marine-Hospital Service are detailed to serve in the office of the consul to enforce the governmental health regulations; and immigrants arriving on this side are by law required to be examined by medical officers of the Marine-Hospital Service, to prevent their bringing contagious disease. These provisions are in themselves national quarantine. Prior to 1891 the surveillance over immigration was left to State commissioners at the several ports, but in that year Congress placed the whole matter in charge of the Treasury Department; and no one will deny the benefits resulting from the change.

Notwithstanding the above argument, the quarantine bills introduced into Congress, and already referred to, do not abolish or inter-

fere with efficient State or local quarantine establishments. They require simply that these establishments shall execute the national regulations, and it is only in the event of inefficiency that the Government intervenes. They enable the Government to establish quarantines at places where they are deemed necessary by the Secretary of the Treasury.

In addition to the 12 national quarantine stations operated by the Government, there are a number of State quarantines well equipped and conducted. Some of these, as at Boston and New York, have been established at great expense, and are efficiently equipped; and the quarantine bills referred to do not disturb them, leaving it to the discretion of the municipal governments themselves to determine when they may choose to be added to the national quarantine stations. Overtures have been made by certain quarantines to this end, inasmuch as a national station is supported by a Congressional appropriation and relieves the shipping of the port of quarantine fees.

Now, there is annually introduced in Congress some bill looking to the establishment of a new bureau of public health, the authors laying stress upon the name of the Marine-Hospital Service as not indicating any public health functions, and claiming that it was originally established for the relief of sick and disabled seamen of the merchant marine. This latter statement is true. But the service was established a century ago; it is now in its centennial year, and during the past one hundred years it has grown, just as other branches of the Government have grown. During my twenty-two years' connection with the Service I have seen many important functions added to it. The fact that it has the care of 20 marine hospitals and 150 other relief stations, with a corps of 78 commissioned officers and 136 noncommissioned officers, specially trained in the performance of duties akin to those of quarantine, is considered to be, instead of an objection, an additional reason why the Service should be charged with quarantine duties. Nevertheless, these bills to establish a new bureau of public health, providing as they invariably do for large representation from the States and local governments, naturally receive the indorsement of such bodies.

Another contention is, that what is needed is sanitation and not quarantine. Yet, with strange inconsistency, two-thirds of the provisions of these bills always relate to quarantine; taking it out of the hands of the Marine-Hospital Service, although the latter has had the management of it, so far as national law permitted, since 1878, with the exception of four years (1879 to 1882), during which a national board of health was in operation by act of Congress. This board, however, was discredited and discontinued by Congress. Some of those most earnest in accomplishing its downfall are now the advocates of a similar board. The Marine-Hospital Service, despite its name, has continued to exercise quarantine and other functions, and has been the only medium through which real progress in the matter of national quaran-

tine has been accomplished. The so-called public health bills are retrogressive in this respect, as they are necessarily framed with a view to securing the assistance of local quarantine authorities in their passage.

The Marine-Hospital Service has simply executed to the best of its ability the duties imposed upon it by acts of Congress; and in the report of a committee on a department of public health presented to the American Medical Association in May, 1896 (which report was adopted), the declaration was made that the Marine-Hospital Service was, by the act of 1893, converted into a national health department, with very large and far-reaching powers and abundant means. It is not called a department of public health, but is a department of public health in fact.

In a letter to the chairman of the Committee on Interstate and Foreign Commerce of the House of Representatives, January 3, 1894, the Secretary of the Treasury, commenting on one of these bills to establish a bureau of public health, said:

The bill does not establish a bureau of public health, as that term is generally understood, or, if it does, then a bureau of public health already practically exists in the Marine-Hospital Service which is now exercising every essential function that is provided by the bill.

In illustration of this statement I shall only briefly allude to measures other than quarantine and marine-hospital relief which are receiving the attention of the Service. These are special investigations in the perfectly equipped laboratory of the Service into the causes and nature of disease; a commission appointed by the President to investigate yellow fever in Habana; the weekly publications of the bulletins of public health; and investigations of the pollution of water supplies and of the prevalence of leprosy. Bills specially authorizing these last two measures are now before Congress.

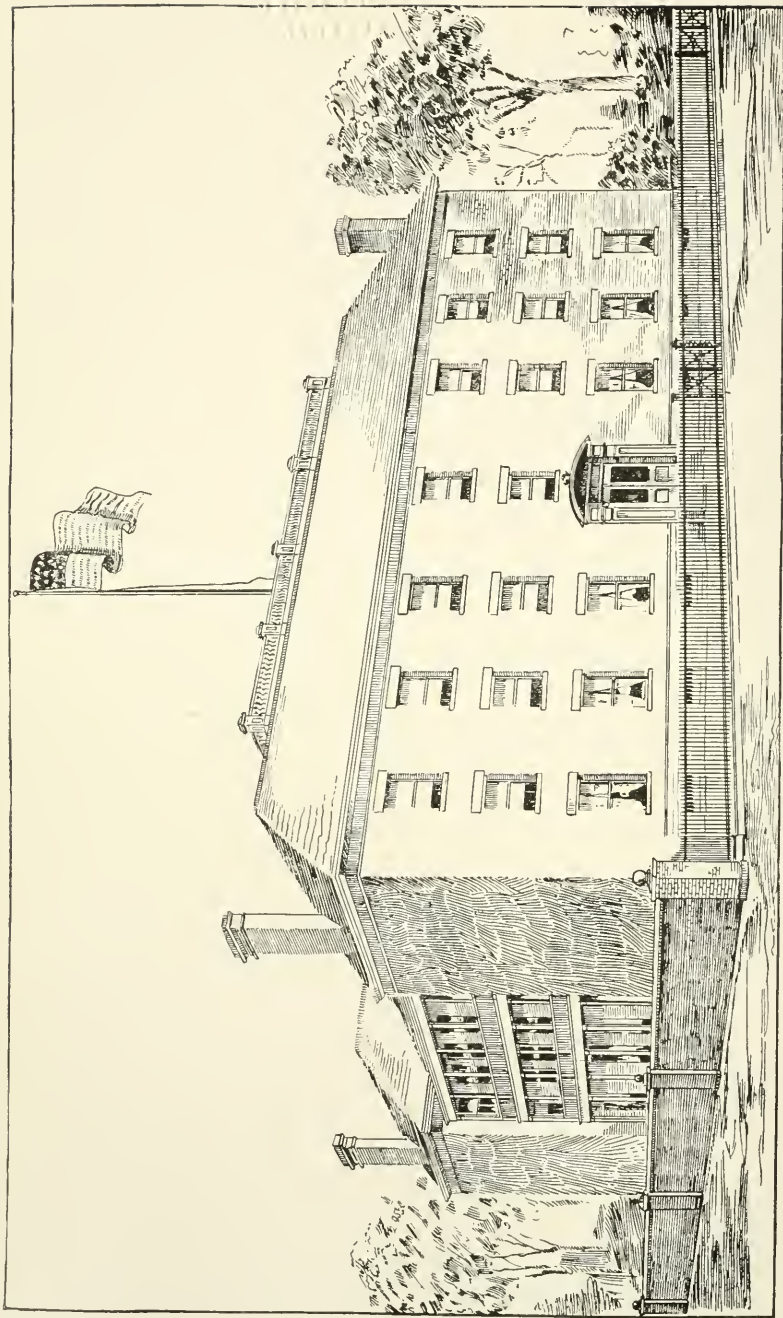
To enumerate the steps now being taken to prevent the introduction from abroad of contagious diseases would extend this article beyond its proper limit; but it may be said that very unusual measures are now being perfected with regard to the prevention of the introduction of yellow fever next summer. Quarantine measures, as stated at the outset, are followed in close sequence by sanitation, and in the efforts to prevent an invasion of yellow fever the Government is not losing sight of the necessity of sanitation in Cuban seaports.

There is little doubt that, with American predominance in the island of Cuba, the dreaded scourge of yellow fever will be suppressed and will, in course of time, almost, if not entirely, disappear. But a still further advance should be made. That great pestilential center, Habana, even if purified and freed from yellow-fever infection, will still be subject to reinfection from other ports in Central and South America, which are in almost as bad a condition. It is, therefore, worth serious consideration whether anything less than the total elimination of yellow fever from the American continent should be attempted; and it should be remembered that this disease is practically limited to the Western Hemisphere.

It is not pure optimism to suppose that an international sentiment may be awakened which will cause yellow fever in a given port, and the faulty sanitation which it implies, to be an opprobrium upon the government in possession of the offending port. Every nation should be held responsible for conditions, within its borders or dependencies, tending to propagate epidemic diseases and to threaten other nations with which it expects to maintain a friendly commerce. As soon as the cities of our own dependencies are freed from fever by sanitation, it would be appropriate for this Government to invite in convention representatives of each of the other American republics; the convention to be composed of public sanitarians, civil engineers, and financiers, whose duty it should be to prepare a treaty providing for the examination of the chief yellow-fever ports by a commission representing the republics concerned. Each country should obligate itself to put into effect the measures recommended by this commission, or measures of its own which should meet with the commission's approval.

Since obligations without penalties would be worthless, the treaty should provide that if after a sufficient time these improvements are not made each of the other nations interested should impose such discriminative tariff or tonnage tax or quarantine restraints upon the offending nation as would cause it in his own interests to comply with the terms of the treaty. Provision might also be made in the treaty that if, by chance, the necessary funds were lacking, a loan to provide them should be raised by pro rata assessment upon the other countries. This suggestion may seem to some impracticable; yet, when one reflects upon the constant dread, the great mortality, the burdensome restraints on vessels and persons, and the destruction of commercial prosperity, caused by this Western pest, no effort to suppress it can be considered too great. I am assured by those who are intimately associated with the representatives of the Central and South American republics in Washington that the plan is by no means impracticable, but is rather one which, if the initiative be taken by the great Republic of the United States, will be gladly and quickly entered into by the other republics of the Western Hemisphere.

It could be shown, in favor of such a treaty, how greatly it would benefit each of the countries entering into it, by relieving their commerce from present burdensome and expensive quarantine restrictions. Its effect would be far-reaching, and would mark an epoch in the matter of health laws and sanitation; for the improvement of harbors and cities, to prevent yellow fever, would bring corresponding improvement with regard to other diseases and would give an impetus to municipal sanitation everywhere. It would also have the effect of bringing closer together, commercially and socially, the great cities on this side of the Atlantic; so that we should feel a common friendly interest in freeing our commerce, our harbors, and our towns from this common enemy.



FIRST UNITED STATES MARINE HOSPITAL, CHICAGO, ILL.

Erected 1852; destroyed by the great fire of 1871. Drawn from a sketch made by Dr. Ralph N. Isham for Dr. Sawtelle, by Allyn A. Packard, architect, 1899.

HISTORICAL SKETCH OF THE SERVICE AT CHICAGO, ILL.

By Surg. H. W. SAWTELLE.

PORT OF CHICAGO, ILL., *May 13, 1899.*

SIR: I transmit herewith a brief historical sketch of the Service at this port which will be of more or less interest to the bureau. It has been quite difficult to obtain even the data embodied in this report, on account of the destruction of official records by the great fire of 1871. * * *

Respectfully, yours,

HENRY W. SAWTELLE,

Surgeon, U. S. Marine Hospital Service.

SURGEON-GENERAL, MARINE HOSPITAL SERVICE.

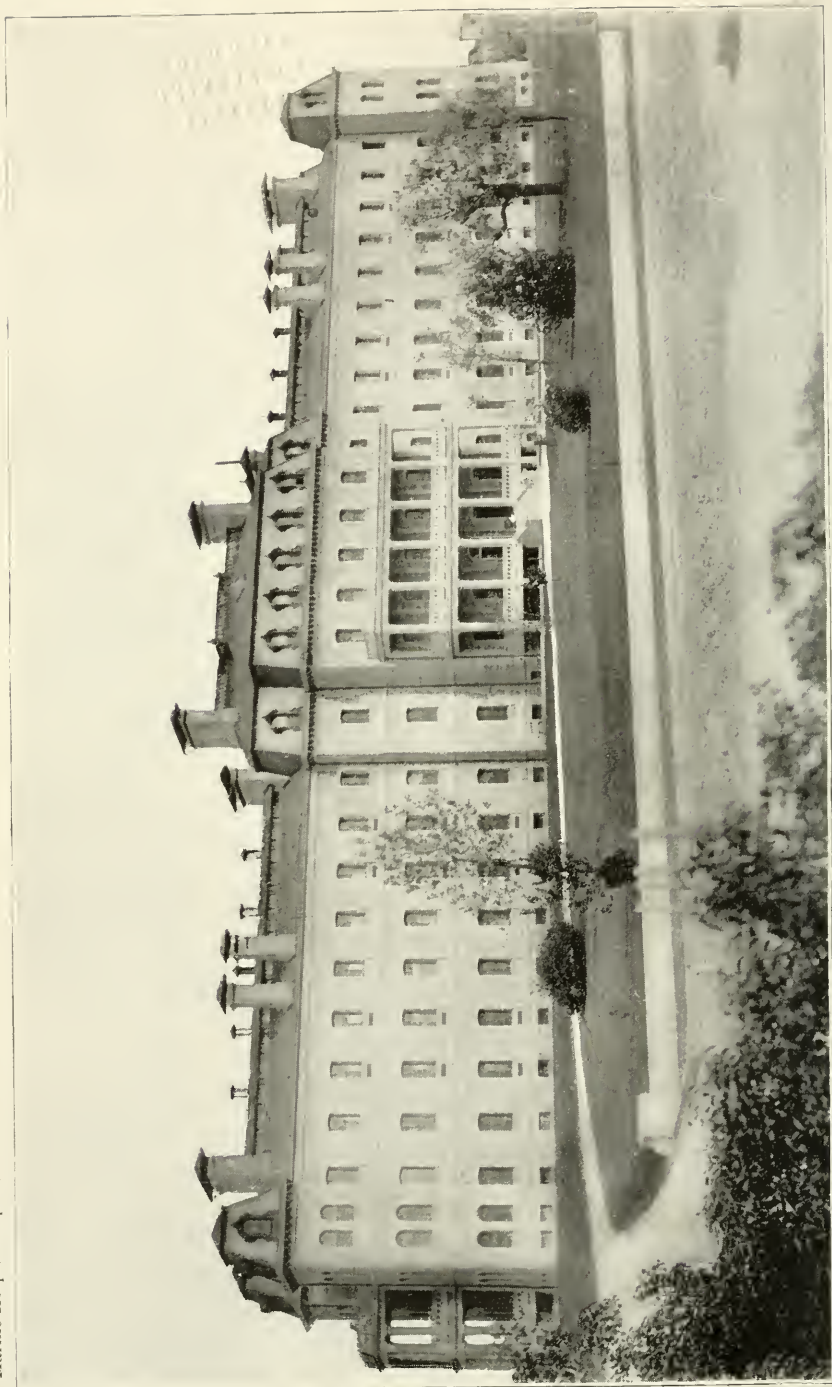
The navigation of the Great Lakes, as carried on by the various aboriginal tribes of the Northwest, was limited to the use of the bark canoe, which afforded the means of transportation for the exchange of commodities between the Indians and white men at the different trading places along the wooded shores. In opening up the Northwest Territory the French were the principal pioneers in respect to maritime affairs, as in other enterprises for the development of the region and the civilization of its inhabitants, old and new. In 1679 LaSalle, the explorer and discoverer of the Ohio River and the mouth of the Mississippi, built the first sailing vessel of the upper lakes, the figurehead of the craft being a "griffin," which indicated the name by which it was known. The development and extension of the fur trade in the course of time called for vessels of larger burden than those of the early explorers and missionaries, and the demand for increased transportation facilities gave rise to the Mackinaw barges, which took the place of the primitive canoe. These boats were manned by crews attired in red flannel or leather shirts, with cloth caps of some brilliant color with a tassel hanging from a point on one side. In common with the frontiersmen in the early days, these boatmen were naturally fond of adventure. A writer says—

These rangers of the woods and waters were a wild-looking set, their weirdness being often enhanced by the dash of Indian blood. They had a genuine love for this occupation and muscles that never seemed to tire at the paddle and oar. From dawn to sunset, with only a short interval or when a breeze sprung up to enable the little craft to carry sail, they would ply these implements, causing the canoe or barge to fly through the water like a thing of life; but often contending against head winds and gaining but little progress in a day's rowing.

But notwithstanding the long hours of work the food upon which they were obliged to subsist was quite scanty compared with the rations served to our seamen at the present day. The morning and evening meal consisted almost universally of bouillon, a soup made from beans, pease, or hulled corn, with a piece of pork boiled in it, and hard bread or sea biscuit. To the northern voyagers rations were generally served out, viz: "One quart of hulled corn and half a pint of bear's grease, or oil," this being the daily and only food. According to the traveler Henry (1776), "a bushel of hulled corn with 2 pounds of fat was reckoned to be a month's subsistence, no other allowance being made of any kind, not even salt, and bread was never thought of." Such were some of the conditions in brief under which the early lake sailors pursued their vocation in sunshine and storm, often without proper food, adequate shelter, or medical relief, and it is probable that many succumbed from disease, the result of exposure and hardships incident to their life of careless adventure. These trading boats plied to and from Chicago, which was then only a small settlement, for many years, or, up to 1803, when sloops and schooners superseded the old-style craft, and for the time monopolized the lake trade. In 1818 the first steamboat was added to the lake fleet, and in 1831 communication was established between lakes Erie and Ontario, thus connecting the Great Lakes and opening up trade which thenceforward increased rapidly throughout the territory. The increase of commerce and the development of the natural resources of the Northwest brought prosperity to the people, thus making it possible for Chicago to become, as it is to-day, the great metropolis of the West. The protection of the public health soon became an important question for the consideration of the new settlement. Cholera was first introduced into Chicago in 1832 by the army which had been brought from the East to engage in the Black Hawk war under General Scott. It appeared again in 1838 among the laborers on the Illinois and Michigan Canal.

In 1846 public attention was first called to the necessity of making provision for the care of sick and disabled sailors under the organic act of 1798, establishing the Service, and a meeting was held at the Bethel Church in Chicago on Tuesday, February 25, 1846, to take action regarding the matter. A petition was prepared and presented to Congress, and through the efforts of the Hon. John Wentworth a bill was passed in 1848 authorizing the construction of a marine hospital at Chicago, and it was built on the parade ground of Fort Dearborn Reservation, on the east side of Michigan avenue between the river and South Water street. "Dimensions, 128½ feet in length; width, 90½ feet; height of walls, 45 feet,"¹ with three stories above the basement, together with piazzas on the north and south sides. The roof was of galvanized iron. The basement was of stone and the walls

¹Chicago Daily Tribune, December 28, 1850.



UNITED STATES MARINE HOSPITAL, CHICAGO, ILL. FRONT VIEW.

of white pressed brick. It contained 48 rooms, with a water-closet and bathroom on each floor and at each end of the building. Capacity of hospital, 175 beds. The building was completed in March, 1852, and was opened for the treatment of patients in April, 1852. It was a stately edifice, an ornament to the city, and a monument to the humane character of our Government.¹ Though an imposing structure, the interior appointments do not appear to have been in accord with the authorities on hospital construction at the present day as to light, ventilation, and other sanitary requirements. The windows were narrow and the wards and halls consequently "dark and illy ventilated; at least, they would now be so considered."¹ In the summer of 1849 work on the building was delayed owing to the epidemic of cholera introduced by the immigrant boat *John Drew* from New Orleans; also, by immigrants from Europe. It reappeared during the years 1851-1855. Total number of deaths as reported, 2,430. Small-pox also prevailed at different times, and, for lack of adequate hospital accommodations there must have been much suffering among the sick for want of proper care. Up to June, 1861, the total amount expended on account of the construction and equipment of the building was \$57,712. During the war of 1861 the hospital was made available for the treatment of sick and wounded soldiers and seamen of the Navy.

In May, 1864, Congress authorized the sale of the hospital and the purchase of a more eligible site, and on September 5, 1864, the building and grounds were sold to the Michigan Central Railroad² for \$132,000, but the property was not surrendered to the purchasers at that time, and the building was continued in use as a hospital until it was totally destroyed by the great fire of 1871. No casualties were reported as a result of the fire, and the patients were safely transferred to the Mercy Hospital, where they were cared for at a per diem rate under the supervision of a medical officer of the Service.

In 1867 a new site was purchased for the sum of \$10,000, in accordance with the act of Congress of May, 1864. It is located in Buena Park on the lake shore, about 5 miles from the custom-house. The original purchase consisted of four lots, comprising about 8 acres, and since the purchase was made about 3 acres of land has been made on the lake shore, thus making the present reservation about 11 acres.

Work on the new hospital building was commenced in 1869 and was completed in 1872, at a total cost of \$452,000. The structure comprises a central building of four stories, with an upper floor leading to the roof, where the main water-supply tanks are located, and two wings of three stories each and a basement. The entire building is constructed of "Lemont stone," with cut-stone porches of the same material at the west front and the north and south ends. The

¹ Dr. E. O. F. Roler.

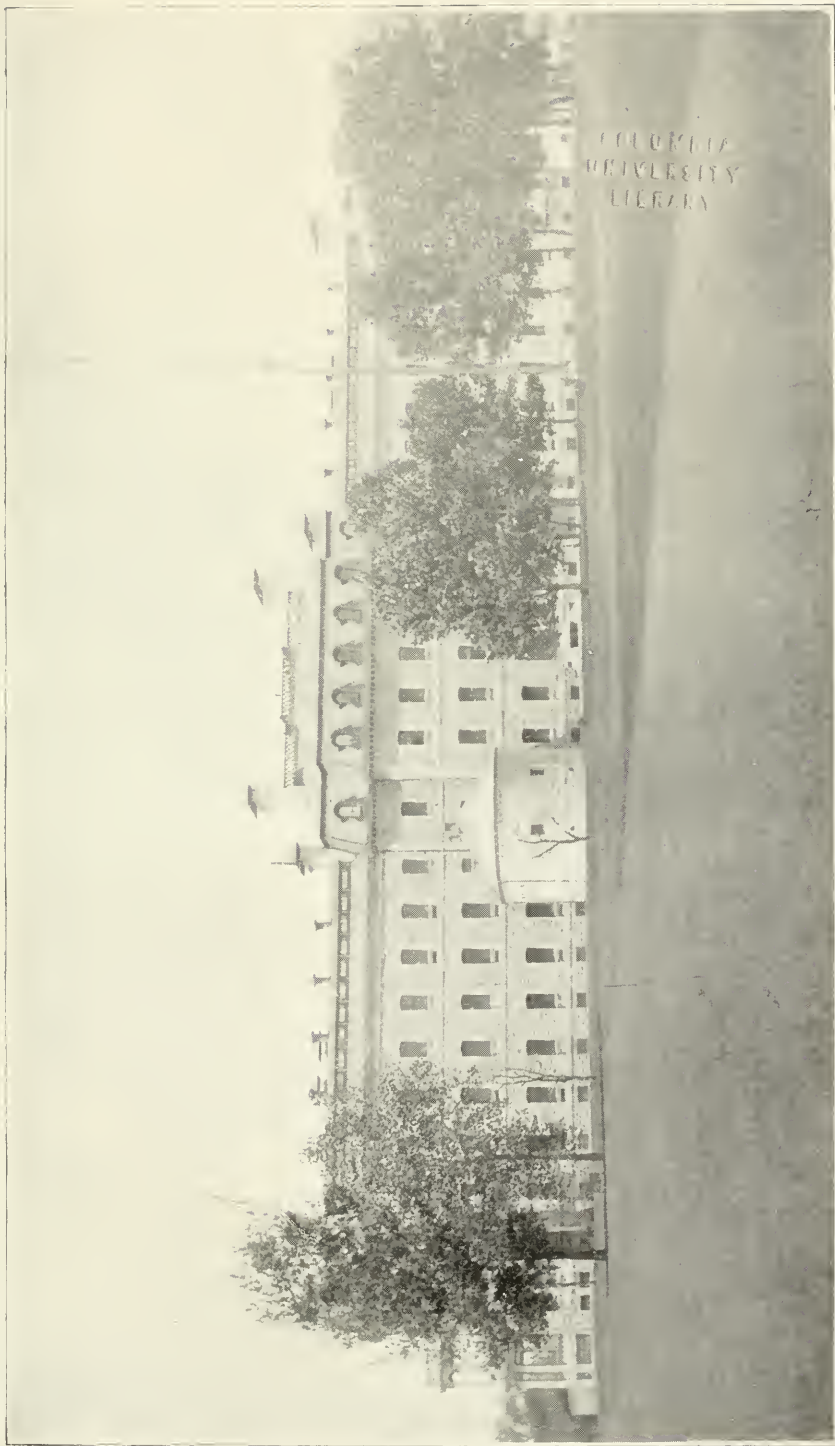
² James F. Foy, agent.

building is 350 feet long by 60 feet wide. The central portion of the building contains the offices, dispensary, and the administration department; also quarters for the medical officers, stewards, and attendants. The wings each contain 3 wards, each capable of accommodating 25 patients, thus making the capacity of the hospital 150, which may be increased in case of emergency. Contiguous to the wards on the north and south ends are smoking rooms, bathrooms, water-closets, and urinals. The hospital kitchen and dining room, also the storerooms, are located in the basement. A new operation room has recently been constructed on the east side of the central portion of the building, which opens into the main hall near the surgical ward. The exterior is built of the same material as the main building. The floor and wainscoting are of white marble, the walls and ceiling of adamantine plaster covered with enamel paint. The skylight frame is constructed with steel bars and copper cap-pings. It is lighted by electricity. The anæsthetizing room, adjoining the amphitheater, is provided with a sink, wash basins, and other appointments complete. The operating room has been well equipped with modern instruments and appliances, including an X-ray machine. A photographic outfit has also been furnished for use in connection with hospital work.

The hospital is lighted by gas, heated with steam, and ventilated by means of shafts ascending from the basement to the top, which are connected with the various wards and rooms by flues, with steam radiators properly located to keep up the circulation of air.

An appropriation of \$37,350 has been made by Congress for an invalid elevator and a new engine house, stable, steam laundry, and isolation ward to replace the buildings now in use, which are antiquated and unserviceable. Proposals have been solicited to construct the new buildings according to the approved plans, and the lowest bid accepted in the sum of \$29,892. The work will be commenced at once and completed probably during the year.

A new sewer has been constructed for the hospital and connected with the intercepting sewer just completed by the city in front of the reservation. Heretofore the sewage of the hospital and city has been discharged into Lake Michigan, which became infected to such an extent that, in the interest of the public health, the municipal council passed an ordinance providing for its purification by diverting all sewage within the limits of the city from the lake, and the intercepting sewer just referred to forms a part of the system of intercepting sewers now being built by means of which the sewage is collected in large conduits from which it will be emptied into the Chicago River. Total length of intercepting sewers and conduits, 16.5 miles. The expense for this work will be about \$3,000,000. To complete the system of drainage inaugurated, a large drainage canal 30 miles in length has been nearly completed which will connect the Chicago and Illinois



UNITED STATES MARINE HOSPITAL, CHICAGO, ILL. REAR VIEW.



UNITED STATES MARINE HOSPITAL, CHICAGO, ILL. REAR VIEW.
(Showing new buildings.)

rivers, by means of which the waters of the Chicago River will be carried to the Illinois River, thence to the Mississippi. The canal will have a minimum capacity of 300,000 cubic feet of water per minute, will cost about \$30,000,000, and, when completed and in successful operation, the waters of Lake Michigan and the Chicago River will thereby be purified and result in incalculable benefit to the people of Chicago as a life-saving measure. In extent and importance this sanitary enterprise is on a scale with the great work instituted by the Government of Mexico for the drainage of the valley and City of Mexico.

[NOTE.—The writer is indebted to the Chicago Historical Society and Andreas's History of Chicago for valuable data relating to the first hospital and the early lake history referred to in the foregoing sketch.—H. W. S.]

Chronological list of surgeons in charge of United States Marine Hospital, Chicago, Ill.

Dr. William B. Herrick	1851-1853
Dr. C. A. Helmuth	1853-1854
Dr. Daniel Brainard	1854-1857
Dr. Brockholst McVickar	1857-1858
Dr. Daniel Brainard	1858-1860
Dr. Ralph N. Isham	1861-1867
Dr. E. C. Rogers	1867-1870
Dr. N. T. Quales	1871-1871
Dr. E. O. F. Roler	1871-1872
Dr. Ralph N. Isham	1872-1876
Dr. Truman W. Miller	1877-1884
Dr. William H. Long	1885-1885
Dr. Charles B. Goldsborough	1886-1887
Dr. Hiram W. Austin	1888-1890
Dr. Frank W. Mead	1890-1891
Dr. John B. Hamilton	1891-1896
Dr. P. M. Carrington	1896-1896
Dr. Henry R. Carter	1896-1898
Dr. Henry W. Sawtelle	1898-

TREATMENT OF SICK AND WOUNDED SOLDIERS FROM THE BATTLEFIELDS OF SANTIAGO, CUBA, AND VICINITY AT UNITED STATES MARINE HOSPITAL, STAPLETON, STATEN ISLAND.

By Surg. GEORGE W. STONER.

Of the 100 sick and wounded soldiers admitted to this hospital July 16, 1898, a large majority received their wounds on the 1st day of July, some on the second and third days of the month, and a few as early as June 24. The wounds in most cases were more than two weeks old, and in some cases more than three weeks old, when the patients were admitted, hence the brief and necessarily incomplete description of some of the cases here reported.

Some of the wounds were slightly infected on arrival, but the majority were in good condition, proving the value of the first dressing properly applied and with due regard to asepsis. Forty per cent of the men were wounded in the upper extremities, 29 per cent in the lower extremities, 10 per cent in the head and neck, 5 in the chest, 2 in the back, and 1 in the abdomen. Four suffered from the effects of heat (sunstroke) and one from concussion of the brain and spinal cord. Many cases were complicated by malaria and diarrhea, and there were two cases of enteric fever (typhoid). Seventeen additional patients, all medical, and chiefly malarial cases, were admitted July 30, having arrived at quarantine the day before on the transport *Leona*.

Many of the surgical patients required comparatively little treatment beyond the necessary changes of dressings, and those wounded in the upper extremities and a number of others have been able to be up and about the hospital and grounds since the day of arrival. Nearly all the wounds were produced by the Mauser bullet, two by shrapnel, and two by pieces of shell, and in one case by shell explosion. The wounds are nearly all perforating. In a few cases the ball remained lodged in the body. Removal was easily effected in two cases by the aid of the X-ray, but no attempt has been made to remove balls lodged in the chest, of which there are two cases, both the men doing well. The wounds produced by the Mauser bullet in many cases were not unlike a large needle wound, the wound of entrance and that of exit in most instances seeming to have been about the same as to size and freedom from laceration. In a few cases the wound of entrance was the larger, and in a few others the conditions were exactly the reverse.

There are six fractures of the upper extremities, three of which are

comminuted. The treatment of the infected wounds, and, in fact, of all the wounds, has consisted for the most part in antiseptic irrigation, followed by iodoform-gauze dressing. In some cases peroxid of hydrogen was first used to cleanse the wound. These measures, together with good nursing, good food, pleasant surroundings, and plenty of air space have thus far given as good results as could reasonably have been expected.

In submitting these notes, I beg to express my obligations to Asst. Surgs. H. S. Cumming and H. B. Parker, and Acting Asst. Surgs. R. C. Craig and T. B. McClintic, and Interne Albert Butler for valuable assistance in preparing the same.

Case 1.—Joseph Bily, aged 31 years; native of Austria; member of Company G, Sixteenth Regiment. Wounded, July 2, 1898. Wound of entrance in frontal bone over left eye; exit, middle of posterior border of sternomastoid muscle, evidently passing through brain tissue. July 16, complained of slight pain and total loss of vision in left eye, but the natural appearance of eye is unchanged, save slight injection of conjunctiva; 18th, wounds healed; 21st, slight paroxysmal pain; 22d, slight pupillary reaction, but total blindness of left eye; 25th, comfortable; 31st, doing well.

Case 2.—Frederick Zeitz, aged 30 years; band musician, Sixteenth United States Infantry. Wounded July 1, 1898. Was lying down when struck by Mauser ball. Wound of entrance in middle of and just anterior to center of ramus of inferior maxilla of the left side, the ball entering sideways, having first hit the earth in front of him. The ball entered the antrum, destroying a considerable portion of the anterior surface and alveolar border of the superior maxilla; going downward and backward, it emerged through the palatal and nasal portion of the same bone, opening into both inferior meati and mouth. Its course was then checked by the molar teeth of right side. He removed the bullet with his fingers, it lying free in the oral cavity, and then applied a first-aid bandage to try and control the profuse hemorrhage. Surface dressings were applied daily for the next six days, when hemorrhage completely ceased; was afterwards removed to the transport *Olivette* and sent north. On admission the antrum and both nasal cavities were found filled with pus, mucus, and fragments of bone. These were removed and cavities frequently irrigated with mild antiseptic solution; granulations formed rapidly and may completely close wound in mouth. The external wound has now (August 2) completely healed. Speech and swallowing are interfered with to a considerable extent.

Case 3.—Paul A. Barteline, aged 19 years; native of Germany; Company D, Sixteenth Infantry. Wounded July 1, 1898, by bullet entering on right side of face, passing through ramus of jaw to opposite side, downward and backward to point of exit below and behind left ear, near the insertion of sternomastoid muscle. July 16, wound

in good condition, apparently healed; no pain, but mouth can not be opened more than about 2 centimeters. July 31, improving.

Case 4.—William Clark, aged 27 years; native of District of Columbia; Company E, Twenty-fourth Infantry. Wounded by a bullet from a sharpshooter in a tree top. Wound of entrance frontal bone above right eye; first point of exit inner side body of inferior maxillary bone, reentering muscles of shoulder, and emerging at inferior angle of scapula. July 16, small wounds of entrance and exit nearly healed, except wound of back, and this is granulating. Total blindness of right eye from probable detachment of retina; cornea opaque; muscular movement of eyeball not affected; 18th, some pain in right eye; 31st, improving, except as to eyesight; August 2, doing well.

Case 5.—David Holden, aged 33 years; native of Tennessee; corporal, Company F, Twenty-fourth Infantry. Wounded July 1, 1898. Bullet entered skull behind right ear and emerged on left side of nose just below inner canthus of left eye; some hemorrhage. July 16, complained of headache and some defect of hearing in right ear; 19th, small quantity of purulent matter removed from right ear; 20th, headache and soreness of right side of face; irrigation of warm solution of borax ordered for ear; 25th, ear improving; 28th, pain right side inferior maxillary; 30th, pain at angle of jaw; 31st, improving; August 3, wounds are healed. Lateral motion of jaw limited by reason of injury to pterygoids. Some sensory paralysis in region supplied by orbital branch of fifth nerve. Membrana tympanum was ruptured, and there was marked tinnitus, but that has nearly all gone.

Case 6.—Charles H. Hoadley, aged 19 years; native of Massachusetts; Company K, Second Regiment Massachusetts Volunteers. Was wounded July 1, 1898. Bullet entered right side of neck and apparently passed upward to ramus of jaw. No wound of exit. On admission to the United States Marine Hospital July 26 wound was healed, and patient was in fairly good condition, save some headache and restlessness at night. July 21, headache all gone; feels first-rate. July 28, X-ray shows bullet, or portion of a bullet, above hyoid bone, behind trachea near common carotid artery, where for the present, at least, it is apparently doing no harm, and patient declines further treatment. Furloughed July 30, 1898.

Case 7.—James Davis, 32 years old; nativity, North Carolina; Company F, Twenty-fourth Infantry. While on the firing line on July 1 he was struck on the forehead by a missile of unknown character and remained unconscious for an hour or so, losing "a lot" of blood. When admitted July 16 his wound was nearly healed and no complications had occurred. The missile raised a horseshoe-shaped flap 7 cm. in length, its convexity downward, and 5 cm. above the glabella. The wound is now healed. There has been no indication of any wound to the frontal bone.

Case 8.—James A. Bingham, aged 38 years; nativity, Indiana;

corporal, Company G, Second Infantry. Wounded July 2, 1898. Bullet entered 1 inch below right shoulder joint anterolaterally, passing directly backward through muscles, but emerging 3 inches from point of entrance. July 16, wound in good condition. Says he had some fever on the voyage from Santiago to New York; 17th, some pain on motion; has troublesome cough and bronchitis; no fever; 21st, feeling better; cough less annoying; 24th, says his "bones ache;" bowels loose; 27th, has temperature of 38.2° C. (100.6° F.); pulse, 80; 29th, temperature 37.2° C.; 30th, temperature up to 38.4° C. (101.2° F.). August 2, temperature has risen 1 degree every afternoon the last four days, dropping back half a degree in the morning, and is now—evening—up to 40.2° C. (104.4° F.); pulse, 100; bowels quite loose; no pain. Typhoid fever of severe type.

Case 9.—Willis E. Parker, aged 24 years; nativity, Illinois; sergeant, Tenth United States Infantry. Wounded July 1, 1898, in upper third left forearm, middle of left arm, left shoulder, neck, and right shoulder; a wound of entrance and exit in each locality; ten wounds in all. First wound of forearm with comminuted fracture of radius, wound of entrance being on exterior surface of arm over ulna about 4 inches below elbow joint. Ball went downward and inward, fracturing the radius with slight comminution, and made exit over inner border of radius about 2 inches lower on arm than wound of entrance. The arm being strongly flexed at the time, the ball passed through skin and fascia over biceps, and again over deltoid; reentrance at insertion of, and passed through right sternomastoid muscle and out at center of right clavicle; reentered at outer extremity of and below clavicle, and lodged under skin over trapezius muscle about center of superior border of right scapula, where it was removed by skin incision. Hemorrhage free at all wounds; first-aid dressings applied one hour after wounds were received and again next day. Left forearm was dressed with a wire splint on July 2, and on July 8 was encased in plaster dressing on the transport *Olivette*. On admission arm was examined and fracture located; some callus but no union; splint applied. August 3, fracture firm; all wounds healed; utility of parts good.

Case 10.—Andrew Kretschener, aged 33 years; native of Germany. Corporal, Company C, Sixteenth Infantry. Wounded July 1, 1898. Bullet entered arm at middle of deltoid muscle externally and passed directly inward, producing a comminuted fracture of humerus, and, entering the chest between fourth and fifth rib, passed downward and backward through the lung to final point of exit over spinous process of twelfth dorsal vertebra. July 16, has antiseptic dressing and wire splint on arm. Hemoptysis was marked for some days, but ceased on the 14th; has some pain in arm; 18th, antiseptic dressing renewed and arm and forearm placed in wire splint; 23d, wounds of soft parts

of arm healed; chest wounds healing; angular splint applied to arm; 31st, doing well.

Case 11.—James Grimes, aged 35 years; native of Kentucky. Corporal, Company B, Twenty-fourth United States Infantry. Wounded July 1, 1898, in left forearm. Perforating gunshot wound, the ball entering on inner border of radius and made exit on outer border of ulna, transversely across forearm and about 4 inches below the elbow joint. Both entrance and exit were enlarged and infected. There was a fracture of both bones of forearm, the radius being comminuted. Hemorrhage was slight; first-aid dressing immediately applied. July 2, dressing was removed; anesthetic given and loose fragments of bone removed; wire splint applied. On admission dressings contained some pus, but wounds were in fair condition; cavity of radius filling up with granulation; bony union at fracture of ulna. Had seven malarial paroxysms on July 17. August 3, forearm still in splints and doing well.

Case 12.—Edward J. Albertson, aged 23 years; native of New Mexico. First Volunteer Cavalry. Wounded July 1, 1898. Penetrating wound by Mauser ball; wound situated just below and internal to styloid process of radius, on posterior surface of arm; is almost healed; a superficial dressing applied; maintains the ball is still in wound; some stiffness of thumb and constant pain. Wound examined on July 26 and found entirely healed. There was an area of fluctuation below wound and on making incision a considerable quantity of pus was evacuated. Ball could not be located. July 27, was examined by X-ray. A Mauser ball is seen lying alongside of and parallel with metacarpal bone of thumb. The incision made yesterday was slightly enlarged under cocaine and the ball extracted. Is now rapidly healing.

Case 13.—Charles F. McCoy, aged 38 years; native of Pennsylvania. Private, Light Battery F, Second Artillery. Wounded July 2, 1898, in elbow joint, right arm. Wound of entrance about 1 inch above external condyle; wound of exit about 2 inches below same point. The arm was flexed at the moment of injury. The ball passed through the elbow joint, apparently doing very little damage. Both wounds are small and healed rapidly. Forearm has a range of motion of about 25 degrees without producing pain. Has almost complete loss of power in muscles of forearm; slight motion in thumb; fingers powerless. Massage will be begun in another week. It usually gives excellent results.

Case 14.—Herman Nicolaz, aged 37 years; native of Germany. Private, Company F, Sixth United States Infantry. Wounded in forearm July 1, 1898. Wound of entrance, $2\frac{1}{2}$ inches above styloid process of ulna, on extensor surface; wound of exit, 1 inch above same point on flexor surface. Produced a compound comminuted fracture of ulna; fragments were removed and drainage used. Wound is in

good condition and healing rapidly. The motions of the wrist joint and fingers will not be interfered with. Had also tertian type of malaria; responded quickly to quinine.

Case 15.—John F. Mack, aged 29 years; native of Ireland. Private Company E, Seventh United States Infantry. Wounded July 1, 1898, by Mauser ball. Entered first at center of axillary border of scapula; after going just beneath the skin for 3 inches it emerged and entered the arm at junction of post-axillary fold, going through triceps, humerus, and deltoid, emerging just above the deltoid tubercle. The first dressing was applied by comrades, considerable pressure being used to control hemorrhage. The next dressing was applied about an hour after the reception of the wound; it consisted of a surface dressing to all wounds except wound of exit; here a plain gauze drain was inserted. This dressing was renewed on July 5; on July 14 was examined, and wound of exit found infected, the infection extending into medulla of bone; was redressed, a plaster cast being applied. On the 17th, on admission, the hand and forearm were markedly edematous and dressings saturated with pus; they were removed and wound thoroughly cleansed, a drainage tube inserted, and the arm loosely dressed in wire splint. Two days later this dressing was removed and the arm found to be in fairly good condition; edema had disappeared; same dressing applied every second day since admission. Bone was found to be perforated and transversely fractured. It is interesting to note that the three wounds that had superficial dressings applied to them healed rapidly, while the one that was the subject of interference became infected and changed the whole course of the injury.

Case 16.—Benjamin J. Hardman, aged 22 years; nativity, Alabama. Company E, Twenty-fourth Infantry. Wound was probably caused by a large-caliber bullet from a sharpshooter in the trees, striking the limb while the forearm was fully pronated. Patient received the wound July 1, and it was dressed July 2 by surgeons at Siboney. The missile entered 7 or 8 cm. above the wrist joint, about one-third way between the outer and inner sides of the right forearm, passing thence downward, inward, and backward (as the arm was pronated) to an exit about 2 cm. above the styloid process of the radius, just external to the radial artery. When first seen here, July 16, the dressings were full of pus. The entrance wound was 3 cm. in diameter and surrounded by unhealthy granulations; the radius seemed to have been blown away (or removed) in part along the course of the missile, so as to leave the intact-articular portion connected with the shaft by a slender anterior connection. The exit was fully 5 cm. in diameter, covered with unhealthy granulations. A linear eschar running upward 25 cm. shows an incision made to remove splinters of bone. Through-and-through tube drainage, with iodoform and bichloride of mercury dressing, have been used, pieces of bone removed from time to time, and the wound is now healthy and healing.

Case 17.—Michael McCartin; aged 26 years; nativity, Ireland. Sergeant, Company G, Ninth Massachusetts Volunteer Infantry. Wounded in finger of right hand, July 2, 1898. Ball first struck dorsal surface, second phalanx, second finger, producing contused wound, then struck second phalanx, index finger, same hand, producing a compound comminuted fracture, splintering the bone throughout its extent. Was dressed at once and frequently afterwards. Wound became infected, sloughs forming. On July 19 had secondary hemorrhage from index finger. July 20, finger was amputated at first joint. On August 1 had malarial paroxysm. Quinine treatment successful. August 4, almost completely healed.

Case 18.—Isom Taylor; aged 27 years. Troop F, Tenth Cavalry. During a charge, July 1, 1898, a Mauser bullet entered the exterior aspect of the left forearm 12 cm. below the elbow crease, and, passing upward, backward, and outward, made its exit through the joint just on a level with the superior aspect of the olecranon as the arm was semiflexed. The wound was dressed at the Siboney hospital, and again on the *Olivette*. July 16, he was admitted here, and when dressed, a rubber drainage tube was found which passed 3 cm. into the elbow joint through the exit wound. A linear eschar 5 cm. long showed incision made by surgeons. Exit wound was 1 cm. in diameter. Pus escaped from tube. Wound of entrance was healthy and was open for 5 cm. X-ray examination shows a separation of the head of the radius from its articulation and a transverse fracture of the neck of the olecranon. Forearm was half pronated, and only a few degrees toward supination is possible. Wound is progressing very nicely, the local swelling and temperature has disappeared, and the drainage tube shows little secretion.

Case 19.—Shelby F. Ishler; aged 21 years; nativity, Illinois. Troop D, First Volunteer Cavalry. Wounded, July 1, 1898, in two places—first by Mauser ball in right thigh, ball entering at inner side about middle of shaft of femur and going transversely outward through skin, fascia, and quadriceps. Wound of entrance and exit extremely small and nearly healed on admission. The second and severest wound is in the right forearm, involving the wrist joint. Wound of entrance near wrist joint on anterior surface of forearm and between the radius and ulna; this wound is about 1 inch in diameter. The ball passed backward and upward, producing a compound comminuted fracture of the radius. The wound of exit on the posterior surface is about 2 inches in diameter, the structures being contused and disorganized. It will be noted that this wound was produced by a large caliber ball (.45 to .50 caliber) of slow velocity and considerable momentum. It approaches in severity the combined wounds of bone and soft parts produced by the Minie ball used during the civil war; fortunately these wounds are rare. It will be noted also that twenty-five years ago the severity of this injury would have justified amputation, while to-day,

August 2, it is almost healed, the deformity is not great, and the hand will at least have partial restoration of function.

Case 20.—Joseph B. Miskewicz; aged 27 years; native of Poland. Company F, Third United States Infantry. Wounded July 1, 1898. Wound of entrance on flexor surface of forearm about 4 inches above wrist joint; wound of exit on radial side of extensor surface of forearm about 1 inch nearer wrist joint. Wound produced by round or large-caliber conical ball; wound of entrance about 1 inch in diameter; wound of exit about same size. Produced compound comminuted fracture of radius. First-aid dressing applied in one-half hour. The next day, July 2, anæsthetic was given, wound of exit enlarged, an incision about 5 inches in length along radius was made, fragments of bone were removed, and several inches of radius resected. Wound stitched. Became infected around wound of exit and entrance and suppurated until admission. Wound cleaned and dressed. Next day wound was considerably inflamed and hand edematous from use of iodoform; sterile dressing applied, and since then healing has been rapid.

Case 21.—William B. Kronskop; aged 25 years; nativity, Ohio. Company F, Seventeenth United States Infantry. Wounded July 2, 1898, by Mauser ball; hemorrhage was slight; first-aid dressing applied almost immediately afterwards; has been dressed at regular intervals since. Wound of entrance $2\frac{1}{2}$ inches below acromial extremity of clavicle on anterior surface of arm; wound of exit midway between and 4 inches above condyles of humerus posteriorly. Both wounds are the same size, being about one-quarter of an inch in diameter, and healed uninterruptedly. Course of ball was through skin and fascia, deltoid, and triceps muscles.

Case 22.—William Apitz; aged 25 years; nativity, Kansas. Company C, Sixth Infantry. Wounded July 1, 1898. Missile seems to have entered palm of hand, causing severe laceration and necessitating amputation of index and middle finger, which was done by the surgeon of the regiment. July 16, some pain; wound infected, dressing changed; wound cleansed and packed with iodoform gauze. July 20, considerable pain. July 21, wound cleansed with peroxid of hydrogen; dressed with iodoform gauze and hand laid on a splint; dressing changed at intervals of two days. July 31, improving.

Case 23.—Justa Mustelier; aged 42 years; sergeant, Cuban Volunteers. Right forearm was shattered and severed in its lower portion by an American shell, July 23, 1898, and a modified skin-flap amputation done in its upper third, June 25, by the surgeon of the United States steamship *Olivette*. When admitted, July 16, there was slight local temperature and some pain, both of which disappeared after wet antiseptic dressing. July 19, patient had pains in abdomen, headache, and a temperature of 40° C. (104° F.). Plasmodium found in his blood and cathartic and quinine given. Temperature has since

been about normal. July 26, fluctuation and pain in joint. By small incision evacuated 25 centimeters of pus and removed a silk ligature, since which time the wound has been healing nicely.

Case 24.—John Hendricks; aged 23 years; nativity, Indiana. Company D, Sixteenth United States Infantry. Wounded by Mauser ball on July 1, 1898. The wound of entrance is small, situated a half-inch below Pouparts ligament, and just external to the femoral artery. Wound of exit posteriorly, on a plane horizontal with entrance, just above gluteal crease and about center of buttock. It is somewhat smaller than the wound of entrance, but did not heal so rapidly. The course of the ball was through the hip joint. A single perforating fracture must have been produced, as there were no symptoms referable to bone lesion after tenderness of the wound had disappeared. On July 2 an area of hyperesthesia developed over the area innervated by the middle and internal cutaneous branches of the anterior crural nerve. This was so intense that the weight of a sheet caused burning pain; could bear no weight on this leg on admission. On July 21, gentle massage, and continued, with daily improvement, until now all hyperesthesia has disappeared and the patient walks with comparative ease.

Case 25.—Michael O'Mealy, aged 38 years; nativity, Ireland. Private, Company A, Twenty-first Infantry. Wounded July 2, 1898, in left buttock; ball apparently still in body; no point of exit; sitting up; slight pain. July 20, 1898, no pain, but some spasm of muscles of leg; 21st, marked spasms of muscles of thigh, painful contractions, requiring hypodermic of morphine; 22d, some fever; feels weak; said he felt as if something had given way or broken about his hip. Evening, spasmodic pain more marked; profuse perspiration; 23d, restless during the night; temperature this a. m., 29.7° C. (103.4 F.). Pain most marked along course of sciatic nerve, and internal pudic at greater sciatic notch; no tenderness of spine; 24th, spasmodic and painful contraction of leg muscles during the night, requiring large doses of anodyne; growing weaker; temperature, 38° C. (100.4° F.); pulse, 120. Wound apparently in good condition. Probe enters to a depth of 1½ inches only, and directed downward and inward toward tuberosity of ischium. Evening, somewhat better, but the spasms are still marked. Later, temperature 40.4° C.; pulse 134, and spasms more severe; 9.15 p. m., incision made down to sciatic nerve, between tuberosity of ischium and great trochanter, where pressure seemed to be, but bullet was not found; recovered from anæsthetic fairly well, but spasms soon returned as severe as they were before; 25th, 4.30 p. m., unconscious; temperature, 41° C.; thready pulse. Died at 5.40 a. m. of the 26th. Post-mortem examination ten hours after death. Large blister noticed at left heel, above os calcis. A considerable quantity of brownish fluid passing from nose and mouth. Upon incision along the course of the wound, the ball, shrapnel, was found about 2½

inches below the skin, in the gluteus maximus muscle, a considerable distance removed from the nerve trunks. There was some discoloration of the muscular tissue in which the ball was embedded, and slight moisture of the part, but no suppuration. A piece of blue cloth, evidently from the uniform trousers, carried in by the bullet, was removed from the wound. The ball was flattened to some extent on one side. Further examination showed marked congestion of the psoas muscle, and after removing the intestines from the abdominal cavity the congestion was found to extend the whole length of the muscle, and the muscle was completely ruptured diagonally across its fibers at a point beginning at the second lumbar vertebra.

Case 26.—Peter O'Connor, aged 25 years; nativity, Ireland. Company D, Eighth Infantry. Wounded July 1, 1898. Bullet entered right foot 3 cm. below inner malleolus, passing downward and forward and out at middle line of sole, between metatarsal bones. Wound healed when admitted, July 16, 1898, but patient complained of chills or chilliness and said he had been sick for a number of days. Temperature, 39° C. (103.3° F.); pulse, 104. Fever continued. Blood examined for malaria plasmodia; none found. 19th, complained of some pain in belly, no diarrhea, tongue coated, spleen enlarged; 20th, bowels moved three times to-day, stools of yellowish-gray color; 22d, marked diarrhea, some cough, bronchitis, typhoid condition; 27th, bloody stools; 28th, another hemorrhage from bowels; 29th, delirious, another hemorrhage, pulse weak. Temperature at 10 a. m., 40.6° C.; pulse, 156. Extremities cold; failing rapidly. Died at 1.20 p. m.

Case 27.—Martin Crowley, aged 22 years; nativity, Ireland. Company D, Seventh Infantry. Wounded July 1, 1898. Bullet entered right hip about 4 inches below superior spinous process of ilium, outer side, and passed diagonally downward but inward to inner side of thigh, upper third. July 16, wounds of entrance and exit in fairly good condition; no pain. July 21, some pain in thigh, and further examination showed a slight swelling; pulsation, characteristic thrill, and bruit of aneurism; probably communication between femoral artery and vein. July 26, wounds healed. July 27, complained of diarrhea and later in day had a chill, followed by fever and malaria, for which quinine was given, with diluted nitromuriatic acid. July 28, less fever; quinine continued. July 29, better; temperature and pulse normal. August 3, doing well; aneurism continues about the same.

Case 28.—Tobias Wunder, aged 29 years; nativity, Germany. Sergeant, Company G, Sixth United States Infantry. Wounded in calf of the left leg, the ball going through the leg transversely and penetrating the skin and superficial fascia for about 3 inches. The wound became infected throughout its extent, an abscess forming. This was opened on July 18 and dressed antiseptically. Continued to dis-

charge pus until August 1, when the whole course of the ball was laid open, the necrotic tissue removed, and wound placed in condition to heal by granulation.

Case 29.—Henry Brightwell, aged 23 years; nativity, Georgia. Company G, Twenty-fifth Infantry. While lying down during the fight of July 1 he was struck by a missile which caused a ragged, lacerated wound upon the outer side of the left thigh, 5 or 6 cm. below the trochanter major. No wound of exit. When he was admitted, the wound was about 4 cm. long and suppurating freely, and he complained of pain in his outer thigh muscles when he walked. The X-ray revealed a bullet about 15 cm. above the external tuberosity of the femur. On July 30 pain had become worse and localized, and a small incision was made until the fascia lata was opened, through which was removed a bullet about the size and shape of an incisor tooth. A small piece of the steel jacket still clung to the wedge-shaped front of the lead bullet. Both wounds are doing well and the patient has no trouble in walking.

Case 30.—Winifred Munson, aged 21 years; native of Kentucky. Company C, Sixth Infantry. While charging El Caney, July 1, 1898, he was struck by a missile which entered the sternum to the left of the midline, about the junction of the manubrium and gladiolus, making a clean, round hole without comminution, passing thence backward and to the right to an exit just below the neck of the scapula, the latter being a lacerated wound 2 cm. in diameter. He advanced 50 yards and then sat down. A comrade removed his clothes, and blood came in "spurts" from the front and continuously from the exit wound, and blood poured from his mouth. A first-aid bandage stopped external bleeding, after which he was neglected, being without food or attention until removal, thirty-six hours after, to the division hospital. For several days he spit fresh blood when he coughed, and this was followed by clotted blood. July 16, before admission, he had a severe hemorrhage, losing fully 7 ounces. When admitted, July 16, the entrance wound was about healed, and the exit was covered with granulations. His temperature was normal, but a cough without expectoration troubled him. The lung seemed to have only a slight diminution in function. On the 21st his temperature rose, and until August 1 remained between 38° and 39° C. (100.5°–102.2° F.); his respirations were rapid and painful, and there was dullness in the middle lobe of the right lung. About August 1 his temperature and other symptoms disappeared, and he improved. There appeared a pleuritic effusion, which reached the fifth rib in front and the inferior angle of the scapula behind.

Case 31.—John K. Emery, aged 23 years; native of Georgia. Company F, Thirteenth United States Infantry. Wounded July 1, 1898. Wound of entrance through the ensiform appendix of sternum; of exit in eighth interspace between anterior and mid-axillary lines.

Course of wound was through the right lung. The injury produced hemoptysis, which lasted several days. Wounds of entrance and exit small, and healed rapidly. On admission he complained of considerable pain over wound; examination showed slight pleurisy; side was strapped and condition improved. Since then he has been steadily improving.

Case 32.—Edward Culver; native of the Indian Territory. Troop A, First Volunteer Cavalry. Wounded by Mauser ball on June 24, 1898. The ball entered the chest in fourth interspace in anterior axillary line of left side. No wound of exit. X-ray shows the ball lying across the fourth and fifth ribs of opposite side, about 2 inches from vertebra. Both lungs were perforated, the ball going immediately behind the heart. The wound of entrance was about 1 inch in diameter, the ball having entered flatwise. Hemorrhage was quite profuse. Hemoptysis began at once, and was also quite profuse; continued about fifteen days. Has been walking around since July 4. Wound of entrance was packed with gauze; it granulated quickly and was completely healed on August 1.

Case 33.—William F. Brewer, aged 26 years; native of Ohio. Company E, Seventeenth United States Infantry. Concussion of brain and spinal cord by explosion of shell. Was making a charge when there was a violent explosion of a shell a few feet to left; was rendered unconscious and remained so about three hours. On regaining consciousness attempted to rise, but vomited blood and contents of stomach, and could not support himself on left leg. Was carried to hospital at Siboney, and then sent north on the *Olivette*. Had considerable pain all the time. Examination shows area of tenderness over lumbar region of cord and muscles of thigh and gluteal region. Was confined to bed, but improved slowly. Potassium iodide in 1-grain doses had little or no effect. Actual cauterization was applied in several locations with great success, the function of leg being almost completely restored in about a week. Massage was painful at first, but later was of some assistance in treatment.

A SKETCH OF THE ENGLISH PROTOTYPE, AND THE DEVELOPMENT OF A HOSPITAL SERVICE FOR SEAMEN IN THE UNITED STATES.

By Surg. CHARLES E. BANKS.

Immediately after the destruction of the Spanish Armada the seamen composing the victorious fleet, which was the largest ever assembled under the English flag, were the heroes and pets of the nation, and in response to a general demand that some provision should be made for them, not only for the relief of their present injuries but to provide for them in sickness, disease, and old age, a hospital was provided for their care and treatment, to be established at Greenwich. This was open for seamen of the royal navy, and was supported by a deduction of 6 pence per month out of their wages. Later this provision was increased by the establishment of an institution at the Chatham dockyards, which was known as the Chatham Chest.

Samuel Pepys, in his diary, under date of November 13, 1662, records the results of an inspection of the chest. He says:

Our first work to read over the institution, which is a decree in chancery in the year 1617, upon an inquisition made at Rochester about that time into the revenues of the chest, which had been from the year 1588 or 1590, by the advice of the lord high admiral and principal officers then being, by consent of the seamen settled, paying 6 pence per month, according to their wages then, which was then but 10s., which is now 24s.

In the history of Rochester, England, the following reference to this institution is found:

The chest at Chatham was originally planned by Sir Francis Drake and Sir John Hawkins in 1588, after the defeat of the Armada. The seamen voluntarily agreed to have "defalked" out of their wages certain sums to form a fund for relief. The property became considerable, as well as the abuses, and in 1802 the chest was removed to Greenwich.

These provisions above named continued in existence for about a century and operated satisfactorily for the benefit of the persons for whom these institutions were founded. A demand arose, however, for similar provisions in behalf of the seamen of the merchant marine, from whom were recruited the "Jackies" of the royal navy. The merchant service, with its system of apprenticeship, has for centuries been the nursery of the royal navy, and a nation proud of its command of the sea, both in naval and mercantile aspects, has not been slow in providing for the men who have made her great, in their times of sickness and injury.

In the Parliament of King William III, sitting in the seventh and eighth years of his reign, there was enacted (March, 1696) a law for the "encouragement and increase of seamen." This act provided that seamen who should register themselves for His Majesty's service and become, by reason of age, wounds, or other accidents, disabled for future service at sea and "not be able to maintain themselves comfortably" should be provided for in the royal hospital at Greenwich, "so far forth as the said hospital should be capable to receive them and the revenue thereof would expend." This privilege also was available for "the children of such disabled seamen and the widows and children of such of them as should happen to be slain, killed, or drowned in sea service." For the maintenance of this institution a tax of 6 pence per month was allowed to be taken out of the wages "of every seaman employed in the merchant service, as well as of those employed in the service of the royal navy."

By an act passed in the ninth year of the reign of Queen Anne the registration features of the foregoing act were repealed, and in the following year an act was passed by Parliament "for the better collecting and recovering the duties granted for the support of the said hospital." Any seaman was to be considered fully qualified for admission upon application who should—

produce an authentic certificate of his having been wounded, maimed, or hurt in defending any ship belonging to the subjects of this Kingdom against the enemies thereof, or in taking any ship from the enemy and being thereby disabled for sea service.

In the reign of her successor, George I, by an act of Parliament, sitting in the eighth year of his reign, providing for the "more effectual suppressing of piracy," it was provided that every seaman on board of any merchant ship "who shall be maimed in fight against any pirate" should receive preference in admission into the royal hospital to any other seaman who should be disabled from service or "getting a livelihood merely by age."

In the reign of the second George the Parliament passed an act in the eighth year of his reign for application for the rents and profits of the estates forfeited by the attainders of James Earl of Derwentwater and Charles Radcliffe for the support of the Greenwich Hospital and the particular maintenance of "seamen on board any merchant ship or vessel who shall be maimed in fight against an enemy of His Majesty."

These various acts, which added from time to time an eligible class of beneficiaries in the royal hospital at Greenwich, created a clientele too large for the limited capacity of that institution, and it soon became necessary to provide other means for caring for this class, not only at the port of London, but at the growing maritime city of Liverpool. Accordingly, in the twentieth year of the reign of George II, "An act for the relief and support of maimed and disabled seamen,

and the widows and children of such as shall be killed, slain, or drowned in the merchants service," passed the House of Commons on the 21st of May and the House of Lords on the 28th of the same month, 1747. The officials charged with the execution of this act proceeded at once to establish a "Sixpenny Hospital" at Liverpool, and utilized a portion of the ground then under a nine hundred and ninety-nine years lease and occupied by the institution of which the present royal infirmary in Liverpool is the lineal successor. This ground was the present site of St. George's Hall, Lime street, Liverpool, and the lease was granted by the mayor and burgesses of the corporation of that city, for a nominal sum, to the officials of the infirmary. The institution originated in 1744, but owing to the disturbed condition of affairs at that time consequent upon the rebellion of 1745 under Charles Edward the Pretender the building was not finished until the latter part of 1748, and was opened on the 25th of March, 1749, for the reception of patients. In the auditor's report, dated "4th March, 1750, to 2d March, now styled 1752," the "public is informed that a debt of 216 pounds, 13 shillings, 5 pence, 1 farthing upon the building, due to the Sailors' 'Sixpenny Hospital,' is paid off," and the front of the field leased out for the erection of "a hospital for decay'd seamen, their wives and children, at a rental of 20 pounds." The receipt of this rental from the "Sixpenny Hospital" is acknowledged only in subsequent auditors' accounts; but no other references being made to the institution in these annual reports indicates that the seamen's hospital had a separate management and existence from its neighbor, the royal infirmary. The seamen's hospital continued in existence until 1826, when it was taken down. (Picton Memorials of Liverpool.)

During a recent visit to Liverpool, and while on a visit to the royal infirmary, I was shown by Mr. Francis H. Moore, the general superintendent and secretary, to whom I am indebted for much of the above information respecting the Liverpool hospitals, an old engraving published in 1753. It has the following inscription:

The north prospect of the public infirmary and the hospital for decayed sailors and their families at Liverpool, the former building supported by private contributions, the latter by a deduction of six pence per month out of sailors' wages, according to act of Parliament.

These laws above cited, and the institutions based upon their provisions, were undoubtedly the sources of inspiration to the framers of the fundamental law of the present Marine-Hospital Service in the United States. It has been always supposed that it was a new idea in government policy, and has passed for an original plan. The above facts clearly demonstrate that a merchant-marine hospital service was in operation in England one hundred years prior to our own. The knowledge of it was, of course, familiar to the framers of our law through the intimate mercantile relations which existed between London, Liverpool, and the North American maritime centers at that period.

The first proceedings in Congress relative to the establishment of a system of relief for sick and disabled seamen were taken under date of July 20, 1789, when it was

Ordered, That a committee be appointed to bring in a bill or bills providing for the establishment of hospitals for sick and disabled seamen, * * * and that Messrs. Smith, of South Carolina, Climber, and Carroll, do prepare bring in the same.

On August 27 following the chairman of the committee reported a bill, and two days later the bill was "ordered to be committed to a committee of the whole House." (Annals of Congress, Vol. I, pp. 659, 786, 795.)

Nothing was accomplished, however, beyond this by this Congress, and it was not until four years later that the matter was again under consideration.

On January 21, 1793, "Mr. Williamson, from the committee appointed, presented a bill for the relief of sick and infirm seamen, which was read twice and committed." (Ibid., III, 830.)

On December 13, 1793, it was

Ordered, That a committee be appointed to prepare and bring in a bill for the relief of sick and disabled seamen, and that Mr. Goodhue, Mr. Watts, Mr. Nicholas, Mr. Winston, and Mr. Malbone be the said committee. (Ibid., IV, 142.)

This seemed to be the extent to which efforts of the friends of this measure had progressed, and the matter was apparently allowed to slumber for four years more, when the final effort, which resulted in its enactment into law, was undertaken by members of the House representing the great maritime ports of New York, Baltimore, and Charleston.

The debates in Congress preceding the passage of the act for the relief of sick and disabled seamen are to be found in Volumes VII and VIII, "Annals of Congress," and from these volumes I have made the following abstract of the remarks which were delivered and the proceedings which occurred during the passage of the bill:

On November 22, 1797, Mr. Edward Livingston, of New York, said there was a report of a select committee on the operations of the act for the relief and protection of American seamen, which included the subject of the establishment of a marine hospital and other important matters. He wished this subject referred to a committee of the whole. Agreed to, and made the order for Tuesday. (P. 630.)

On November 29 (Tuesday following) the subject was debated and the following resolution passed:

That a certain deduction shall be made from the wages of seamen for the maintaining of the sick and disabled, and for the support of a hospital. (P. 655.)

On December 26, 1797, on motion of Mr. Livingston, of New York, "a committee was appointed to bring in a bill for the relief and protection of American seamen." (P. 763.)

On January 8, 1798, Mr. Livingston reported the bill favorably. (P. 810.)

On February 15 following the bill was debated, but no definite action taken. (P. 1035.)

On February 25 following the subject was further debated and the matter finally recommitted to the committee of the whole for further consideration. (P. 1068.)

On February 28 Mr. Livingston, in behalf of the Committee of Commerce and Manufactures, reported to the House a bill for the relief of sick and disabled seamen. (P. 1097.)

On March 8, after some conversation on the subject of a marine hospital proposed to be established by this bill, as to the best manner of securing a support of it from the whole body of sailors of the United States, it was further debated, and the following adopted:

That every owner or master of a vessel arriving from a foreign port into any port of the United States shall, before the vessel is permitted to be entered, pay — cents per month during their voyage for every man whom he has on board his vessel, which he shall be authorized to retain out of their wages. (P. 1246.)

On April 10, 1798, the principal debate on the passage of the bill occurred. Samuel Sewell, of Massachusetts, was the principal speaker against the proposal. He said that in his section of the country there were already provisions for the care of sick and disabled seamen, who “now pay their full proportion of money for public charity.” He thought the tax would be “drawn from the earnings of a small part of the community, who, in all probability, would receive no advantage from it for fifty years to come, as large and splendid buildings must first be erected to exhibit to the world a specimen of public charity,” and that the sailors of New England would object to paying double taxation.

Mr. Pinckney, of South Carolina, favored the bill and answered some of the objections raised by the preceding speaker as to the inequalities of taxation complained of by the gentleman from Massachusetts.

Mr. Livingston spoke at length in support of his bill, and charged the State of Massachusetts with being a recipient of bounties for various maritime interests, and said that objections from representatives of that State to the small taxation provided by the bill did not come with very good grace. He said that—

if he knew anything of the careless, honest nature of this class of men they would not object to so trifling a sum as 20 cents a month for so valuable an object. A sailor [he said] is concerned only for the present, and is incapable of thinking of, or inattentive to, future welfare. He is therefore a proper object for the care of Government, and whilst he can provide an asylum for infirm or old age by the sacrifice of a few gills of rum he will not scruple to do it.

He controverted Mr. Sewell's argument about “magnificent buildings” and intimations of extravagance in the management of the proposed fund, and showed that the first object of the bill was the immediate relief of sick and disabled seamen, and that if any surplus arose

after these disbursements the erection of necessary buildings only was provided in the bill.

Mr. Sewell replied to Mr. Livingston, saying, "He is the father of this bill," and repeated that sailors in his section did not want such a law. He had greater respect for seamen than that gentleman, and it was his opinion that the sailors were able to take care of themselves without the assistance of the gentleman from New York. "This tax," continued Mr. Sewell, "would have an effect to drive away seamen out of the country."

Mr. Samuel Smith, of Maryland, supported the measure, which he said "would redound to the honor of the United States."

Mr. Josiah Parker "felt sorry the gentleman from Massachusetts would not consider all the seamen of the United States as standing upon the same ground," and eulogized the English plan of caring for the sick and disabled seamen of that nation, which circumstance, he thought, was the reason "that the British sailors are so valiant a set of men."

Mr. Joseph B. Varnum, of Massachusetts, "did not think that this kind of taxation was consistent with Federal principles."

Mr. Albert Gallatin, of Pennsylvania, expressed his opposition to it on general principles of class legislation.

Seeing [he said] the Representatives from New York, Baltimore, and Charleston in favor of it and the Eastern States against it, and not knowing the wishes of the people of Philadelphia, he should ask for time to obtain some information on the subject.

Mr. Livingston agreed to the adjournment of the debate, as he felt sure that the more Mr. Gallatin investigated the desires of the people for this bill the surer he was that the gentleman would become favorable to it. (P. 1386.)

On April 12th, two days later—

the bill for the relief of sick and disabled seamen, after considerable opposition from Messrs. Sewell, (Harrison Gray) Otis, and (John) Reed (all of Massachusetts), was passed, 59 votes being in its favor. (P. 1402.)

The proceedings in the Senate were very brief, and apparently the measure was unopposed. A committee, consisting of William Bingham, of Pennsylvania, Benjamin Goodhue, of ———, and John Langdon, of New Hampshire, was named to consider the subject, and the chairman reported the bill without amendment. On March 2, 1799, the bill was passed without debate. (P. 2240.)

From the tenor of the debates in the House it is evident that it was the intention of the framers of the bill to provide for a permanent asylum for sick and disabled seamen in their old age—a feature of administration which has never been entirely carried into effect. The opposition from the New England States may have been of a political character, as references to party principles were frequently made.

The allusion of Mr. Sewell to the gentleman from New York as

“the father of this bill,” places upon Mr. Edward Livingston the credit of authorship, and he can therefore be officially regarded as the father and founder of the Marine-Hospital Service.

The Hon. Edward Livingston had a distinguished public career. He was a son of Judge Robert R. Livingston, of New York, and having advantages of family influence and natural ability he rapidly gained distinction in the legal profession, which he had adopted, and became prominent in local and national politics. He was twice mayor of New York City, judge of a municipal court, and from 1795 to 1801, the period covered by the debates on this bill, he was a prominent Jeffersonian member of Congress. He removed to New Orleans in 1804, on account of financial troubles, and acquired there a brilliant reputation as a lawyer. He spent many years in preparing civil and criminal codes for Louisiana, which won for him a wide fame in Europe and Spanish America. He was a member of Congress from 1822 to 1829, United States Senator from 1829 to 1831, Secretary of State from 1831 to 1833, minister to France from 1833 to 1835. He died May 23, 1836, at his residence at Rhinebeck, N. Y.

It is not the purpose of this paper to carry the story beyond the present point, which covers matter not heretofore traversed by other writers. The subsequent history of the Service becomes one of detail, of development at ports and places from year to year. The story of these beginnings at the various maritime centers of our country has been told by officers in the various reports of the Service, especially in 1896, 1897, 1898, reference to which is here made. The early records of the Service are meager, and many of them prior to 1833 have been lost in fires which have occurred at the Treasury Department. Until 1832 there were but three marine hospitals in the Service—Norfolk, Boston, and Charleston, S. C.—and such material as relates to them would have to be sought out in the correspondence of the Secretary of the Treasury for that period. The records from April 8, 1833, to the beginning of the civil war are contained in four volumes, and consist of the daily correspondence of the Secretary of the Treasury with collectors of customs and surgeons in charge of hospitals at the various ports respecting the routine details of the Service, appointments to office, dismissals, and the statements of general policies.

An interesting communication under the latter head appears under date of June 29, 1843, relative to imposing the hospital tax on slaves in the Southern States. It was addressed to Thomas G. Morgan, collector of customs at New Orleans, by the Hon. J. C. Spencer, then Secretary of the Treasury. In this communication the Secretary informs the collector that—

the exemption of foreign seamen employed in American vessels, and of slaves employed in the navigation of the Mississippi, from the operation of the act of 16th July, 1798, * * * is, in my opinion, founded in an erroneous construction of the

act. No such discrimination is authorized by its terms. On the contrary, masters are subject to its penalty for rendering a false account of the number of men and the length of time they have severally been employed.

On March 9, 1844, this decision of the Secretary was reversed by himself in a letter to G. Dorsey, esq., collector of the port of New Orleans, in succession to Mr. Morgan. In this latter communication the Secretary says:

Upon further examination of the records of the Department, it is found that the practice of exempting such persons (slaves) has been authorized by circular instructions from Comptroller Steele in 1798, and has been uniformly continued under the direction of successor officers of the Department. Under these circumstances I am unwilling to disturb such a settled construction of law without an act of Congress. * * * It is to be understood, however, that such persons are not to be admitted to the relief of the fund.

In a subsequent communication on the same subject, under date of June 21, 1854, the Hon. James Guthrie, the then Secretary of the Treasury, reaffirms the same decision. The Secretary says:

I have to state that slaves employed as part of the crew of any vessel are not considered by the Department as subject to hospital tax, and it has not been the practice to extend to them the usual relief to which sick and disabled seamen are entitled.

The story of a service devoted to the care of the sick is not composed of thrilling details or romantic experiences, but the sum total of its services to humanity, if told in figures and in plain facts, might well outweigh the more interesting and pleasing details of heroism and romance.

APPENDIX.

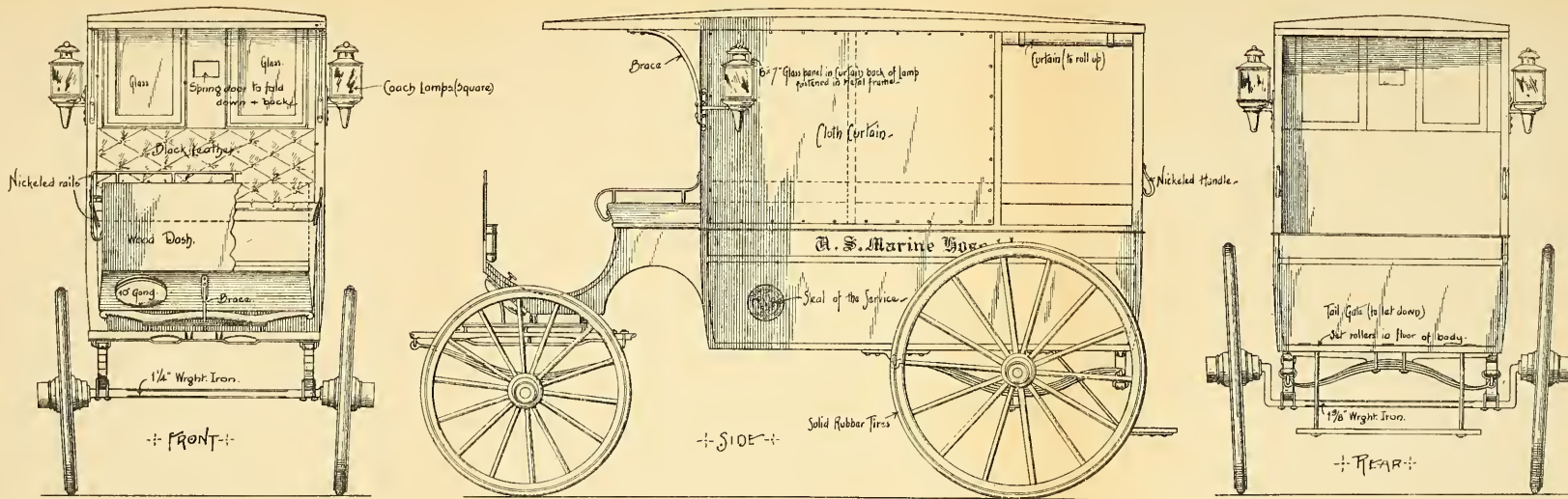
[Extracts from the act of Parliament, 20 George II (1747).]

SEC. XVII. And, for the effecting the good ends and purposes aforesaid, be it enacted by the authority aforesaid, that every seaman or other person whatsoever who shall serve or be employed by any person or persons whatsoever in any merchant ship, or other private ship or vessel, belonging or to belong to any of the subjects of His Majesty, his heirs or successors in that part of Great Britain called England, and every master or owner navigating or working in his own ship or vessel, whether employed on the high sea or coast of the same, or in any port, bay, or creek (other than such apprentices, under the age of eighteen years, as are exempted from payment of six pence per month to the said royal hospital at Greenwich by an act made in the second year of the reign of her late Majesty Queen Anne, for the increase of seamen and better encouragement of navigation, and security of the coal trade, and such person or persons as shall be employed in any boat upon any of the coasts of that part of Great Britain called England in taking of fish which are brought fresh on shore, and every person and persons employed in boats or vessels that trade only from place to place within any river of that part of Great Britain called England, or in any open boats upon the coasts of the same), and pilots employed on board any ship or vessel, shall, from and after the twenty-ninth day of September, one thousand seven hundred and forty-seven, pay, and there shall be allowed and paid by every such master, owner,

seaman, or other person employed or that shall be employed, six pence per month of lawful money of Great Britain and proportionably for a lesser time, during the time he or they shall be employed in or belong to the said ship or vessel, for the uses and purposes aforesaid.

SEC. XVIII. *And it is hereby declared and enacted, That the master, owner, or commander of every such merchant or private ship or vessel is hereby empowered and required to deduct and detain out of the wages, shares, or other profits payable or accruing to such seaman or other person employed in his ship or vessel the said duty of six pence per month (other than for such apprentices and other persons as are before excepted), and shall pay the same to such officer or officers as shall on that behalf be appointed by the said president and governors, or the trustees to be appointed at any of the outports, and their successors, for the collecting, recovering, and receiving the said duty of sixpence per month, respectively, if such seaman or other person shall have or be entitled to any such wages, shares, or profits.*

SEC. XIX. *And be it further enacted, That it shall and may be lawful for the said president and governors, and their successors, at a full court of assistants or committees, to appoint such person or persons as they shall think fit to be receiver or receivers of the said duty at the port of London, and also depute and appoint the collectors or other officers of the customs of His Majesty, his heirs or successors, in the several outports of that part of Great Britain called England, or such other persons as they shall think fit, to collect and receive the same (except in such outports where separate trustees shall be appointed by virtue of this act); which said receivers, as also the said collectors and officers of the customs (if so appointed), are hereby empowered and required to collect, receive, and pay over the said duty, according to such instructions and directions as shall be from time to time sent to them in writing by the said president and governors and their successors; and for the care and pains therein of the said collectors and other officers of the customs, and others, to be appointed to collect, recover, and receive the said duty, it shall and may be lawful for the said president and governors, and their successors, at such court of assistants or committees, to make such allowance to them, out of the said duties, as they shall judge reasonable.*



Scale: 1" = 1' 0"

PLAN OF TOP (looking up)

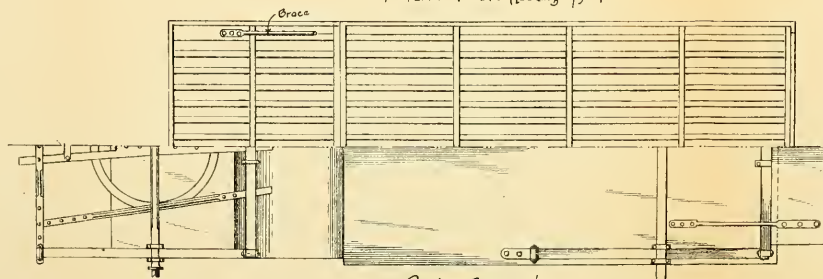
DESIGN FOR AMBULANCE TO BE BUILT

FOR THE

U. S. MARINE HOSPITAL SERVICE.

1899

Estimated Weight: 1100 Pounds.



PLAN OF BOTTOM (looking up)

A NEW SERVICE AMBULANCE.

By Surg. CHARLES E. BANKS.

The improvements in character and style of manufactured articles in all lines for domestic and general use in the last quarter of a century have been nowhere more manifest than in the advances made in material, workmanship, and style of articles for hospital equipment. It is unnecessary to specify instances in this respect, which are so familiar to all who have observed the developments of hospital construction and equipment in the period stated. These general remarks apply as well to the improvements in vehicles in present use, whereby lightness, combined with durability, has been secured, with ease of movement and general adaptability to the special purposes desired. The introduction of the pneumatic and rubber tires for bicycles was followed by their application to vehicles to secure ease of riding, and this improvement seemed especially applicable to ambulances for hospitals, where the comfort of the patient suffering from painful injuries or disease demanded that the maximum degree of comfort should be procured at the expense of all other considerations, and practical experience with this improvement in the running gear of vehicles was only awaited in order that its adoption, which promised so much, should not be considered premature.

The ambulances supplied to the Service twenty years ago, the style of which is familiar to all the officers of the Service, have been in use during that entire period and have, on account of their excellent construction, worn well and served their purpose. They reflected the ideas of ambulance construction so well known in the Army, which were built for use on the plains, where the roads were rough and where fieldwork, requiring strong construction, was one of the elements that determined its size, style, and general construction. Its body was hung high, to clear the brush of the seldom-used roads of the West, and its weight, varying from 1,400 to 1,800 pounds, rendered it necessary for service with a pair of horses. Being so heavily constructed and intended to carry a number of persons, the springs were arranged accordingly, with a view to the load, and when used in cities with modern pavements it presented none of the attributes of an easy-riding vehicle. The improvement in the street pavements of cities where or near which our hospitals are situated has also tended to modify the old idea of a heavy ambulance built on the lines of the army pattern, and within recent years municipal hospitals in various

parts of the country have been gradually lightening their ambulances, and by means of easier springs and other appliances have added perceptibly to the comfort of persons obliged to be transported in them. Acting upon your directions toward supplying our hospitals with the most recent and modern equipment, the subject of ambulances presented itself in consequence of the gradual deterioration of the old style above described and the growing necessity of renewal and repairs.

In the course of visits made to large cities in connection with other official work, and during a visit to Europe, I examined ambulances in use by various institutions, and as a result of the data obtained, and having in view the special needs of our Service, I designed a new ambulance, which received your approval. The specifications for its construction and a photograph of the completed vehicle, with reproduction of the drawings, accompany this article, and will help to give a clearer view of its style and construction. It is intended, in general, as a one-horse vehicle, with provisions for the use of a pair of horses. Its weight will not exceed 1,100 pounds, and it is therefore especially available for quick service. The wheels are rubber tired, of the long-distance pattern, requiring oiling only at long intervals. The body is hung low, about 28 inches from the ground, so that a stretcher can be easily placed in the bottom of the vehicle with a patient and at a minimum of effort by the attendants, who are not obliged to raise the body beyond the natural hang of the arms. An inside seat on one side of the ambulance is provided for patients who can sit up. This is collapsible and swings to the side when not in use. An air mattress is provided for the patient, and, having scarcely any weight, it adds nothing to the load. The curtains at the rear, which are made to roll up, can inclose the occupants of the ambulance, if necessary, by unrolling and fastening to the rear standards. A partition separates the driver from the patient, thus obstructing all currents of air or rain, but the driver has a full view of the interior through adjustable windows at his rear. A speaking tube is also provided, which enables him to converse with the patient or any other occupant of the ambulance. At night light in the interior is obtained from the side lamps, which throw light interiorly as well as forward for the use of the driver. The other mechanical features of the ambulance will appear upon examination of the plans, and it is believed that the vehicle will be of great utility for the purposes designed and add to the comfort of the patients who are obliged to be conveyed in it to the hospital.

Specifications for ambulance to be built for the United States Marine-Hospital Service.

GENERAL SPECIFICATIONS.

The ambulance to be constructed under the supervision of an officer detailed by the Marine-Hospital Service, and the work on same to be performed by first-

class workmen in their several branches, and subject, after completion, to inspection and approval by the Supervising Surgeon-General.

Weight of the ambulance to be not less than 1,050 nor more than 1,150 pounds.

RUNNING GEAR.

Wheels to be Sarven or Warner patent, with solid-rubber tires equal to those manufactured by the American Rubber Tire Company. Tires to be $1\frac{3}{8}$ and $1\frac{1}{2}$ inches in width; front wheels to be 3 feet 4 inches and rear wheels 4 feet in diameter, with $1\frac{1}{2}$ -inch spoke.

The axles are to be wrought steel of the "long-distance" pattern. Front axles $1\frac{3}{8}$ -inch coach shape; rear axle, $1\frac{1}{2}$ -inch crank, with not more than $6\frac{1}{2}$ -inch drop; springs on top, with coach clips underneath, held by four clips.

Trackage of front wheels to be 4 feet 6 inches and rear wheels 5 feet $1\frac{1}{2}$ inches outside of rim.

Springs to be platform pattern, oil tempered, four plates, $1\frac{3}{4}$ inches wide. Front springs to be of Nos. 2, 4, and 5 steel; rear springs of Nos. 1, 2, and 3 steel, five plates.

Length between axles not to exceed 8 feet.

Front gear to be fitted for both pole and shafts and to be supplied with both, which are to be trimmed with harness leather. Pole and shaft gearing to be made interchangeable on front axle. Pole and shaft to be of black hickory, suitably leathered for 24 inches and tipped with brass, and of proper size for the weight and load of ambulance.

BODY.

Length not exceeding 10 feet 8 inches; width of body at bottom, 3 feet 8 inches; width of body at top, 3 feet 10 inches. Top to be securely fixed to body by four upright pillars each side, supporting a framed and slatted roof, top curving each direction from center.

Body to be fitted with a tail gate hinged so as to drop to the rear and closed with automatic catch; a rear step 3 feet long and 10 inches wide, dropped from body by two stepirons.

MATERIAL OF BODY.

Frame of ash; panels of poplar; standards of ash, and frame of roof of ash and slats of same of white pine. Covering of roof to be of black oiled duck. Sides to be fitted with two removable curtains for each side, one for driver's seat and one for two rear posts: the middle section to be fitted with a permanent curtain of same material, adjusted to standards with suitable fastening. Material of curtains to be black rubber duck, the heaviest quality. Front and rear curtains to be adjusted to standards with the Climax curtain button.

Curtains to be of 28-ounce rubber duck.

Roof to be covered with 10-ounce cotton duck, drawn tight and securely tacked.

Bidders to furnish samples of leather and rubber duck.

Partition between driver's seat and body of ambulance to be of ash and fitted with two droplights about 12 by 18 inches on each side of driver's seat, fitted with rubber rollers and adjusted for sliding up and down. Material for glass to be best American plate.

Driver's seat to be upholstered in black leather; back and side cushions filled with best curled hair. Dashboard to be of wood, about 20 inches high, constructed of poplar, and properly braced with dash irons and fitted with metal whip socket.

Driver's seat and dashboard to be fitted with hand rails, as shown in drawing, and a hand rail of similar material to be fitted to rear standard of frame, as shown in drawing: all rails to be nicked on composition.

Two square coach lamps, equal to those manufactured by C. N. Lockwood &

Co., Newark, N. J., to be supplied and securely adjusted to front standard, so as to throw light into the interior of body through side panel of glass, as shown in drawing; said panel to be 6 by 7 inches, double-thick best American plate, securely fastened in metal (brass) frame to curtain.

Driver's seat to be arranged with box under cushion, with brass-hinged cover for implements, etc.

Interior of body to be fitted with longitudinal seat in two parts 12 inches wide, extending the full length of bottom of body, with portable hinges arranged to drop to side when not in use, and supported by three hinged standards tipped on the ends with rubber tips.

The longitudinal seat to be upholstered with dark maroon leather stuffed with best curled hair, made solid with seat.

A wheel brake, operated by driver's foot, to be properly adjusted.

Ambulance to be furnished with one 10-inch gong made of bell metal, fastened beneath the footboard of the driver's seat and operated by a foot tread.

One rubber mat for driver's seat, and floor of body to be covered with linoleum.

FURNISHINGS.

One rear curtain fitted to roll up, and held in place by rubber straps of same material as side curtains.

One storm curtain for driver's seat, of best heavy rubber duck.

PAINTING.

All woodwork of body to be painted as follows: One coat raw linseed oil, two coats white lead, five coats rough stuff equal to Edw. Smith & Co.'s make; rubbed down with lump pumice stone; three coats color, three coats of four-day rubbing varnish equal to Parrot's make. Each coat to be rubbed down with ground pumice stone. Gear and wheels to be painted one coat raw linseed oil, four coats white lead, two coats color, one coat color and varnish, rubbed down with ground pumice stone; one coat rubbing varnish, rubbed down with ground pumice stone, followed by striping. Gear to be finished with one coat elastic gear varnish equal to Valentine's. Roof of body to have four coats of white lead; in color on duck: color to be selected for body and gear.

The following lettering to be placed on each side in the top panel of body: "U. S. Marine Hospital," lettered in gold leaf, old English style. In bottom panel of body the seal of the Service in gold leaf 7 inches in diameter.

LUMBAR PUNCTURE IN TREATMENT OF CEREBRO-SPINAL FEVER.

By P. A. Surg. T. B. PERRY.

TITUSVILLE, FLA., *November 1, 1899.*

SIR: I have the honor to transmit herewith notes of cases of cerebro-spinal fever, on which I performed lumbar puncture while on duty at the port of San Francisco, Cal. These notes are not as complete as I should like to have them, because of my present location and my inability to utilize any memoranda I might have among my books and papers now en route by freight from San Francisco, Cal. They will, however, suffice to express an opinion, formed after a short experience with the Quinke lumbar puncture in the treatment of cerebro-spinal fever, that the procedure is beneficial in these cases.

Respectfully, yours,

T. B. PERRY,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,

Washington, D. C.

CASE I.

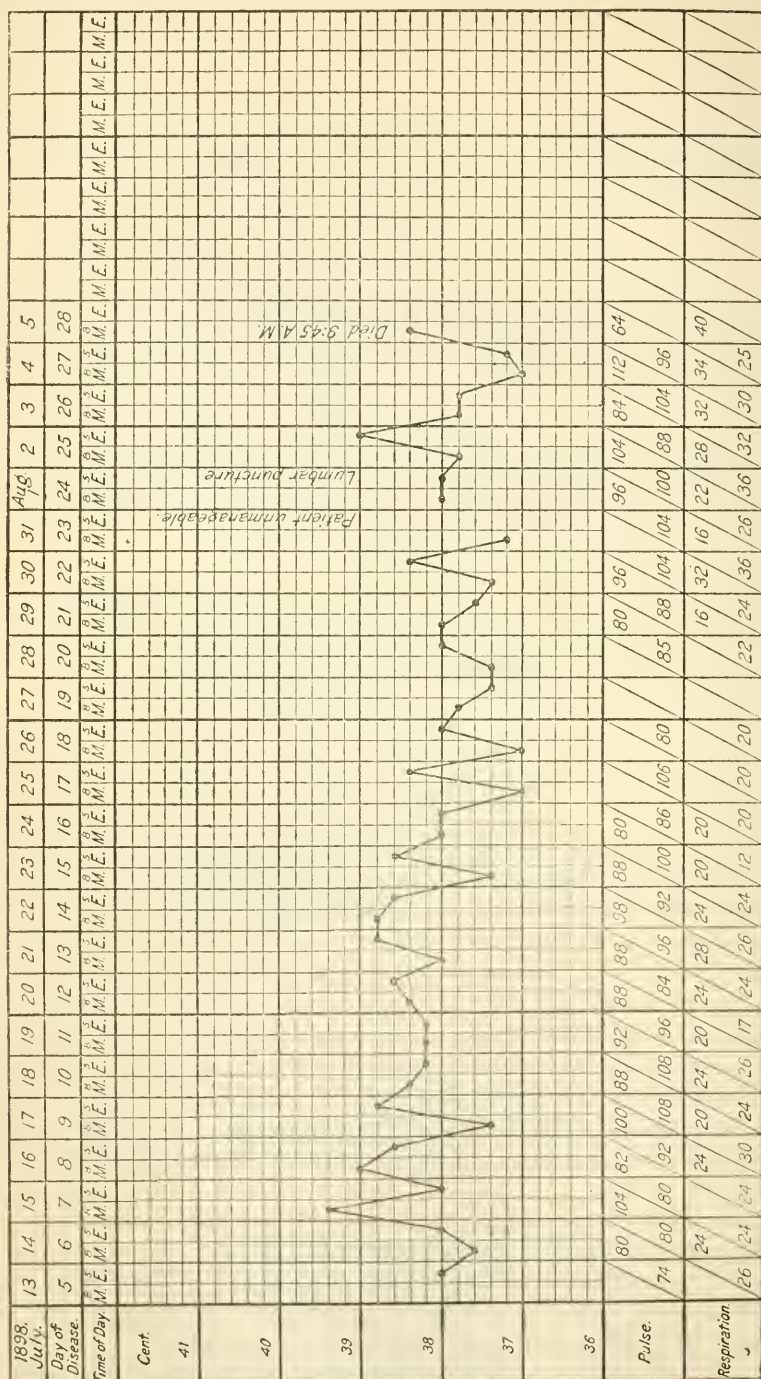
G. W. H., aged 18 years; nativity, California; color, white; private in Company L, Seventh California Volunteer Infantry; admitted to United States Marine Hospital, San Francisco, Cal., July 13, 1898. Illness began about July 8, with vague pains in limbs; three days later admitted to regimental hospital, Camp Merritt; transferred to this hospital July 13, 1898. Condition on admission: Rigidity of muscles of neck (head being drawn backward, opisthotonos); marked tenderness over spine; pupils dilated; no strabismus; marked photophobia; pains in upper and lower extremities; no chills. Following admission patient very delirious; extreme pain along the cervical and dorsal regions; pupils markedly dilated; Kernig's sign present.

July 19.—Patient seemed much improved, and asked permission to leave his bed; moderate, irregular fever continued.

July 30.—Patient's condition less favorable; on following day lapsed into semistuporous condition; rigidity of neck and retraction of head very pronounced; Cheyne-Stokes's respiration.

August 1.—Lumbar puncture performed, with withdrawal of 40 c. c. of almost colorless fluid, which held in suspension small amount

of flocculent material. Following the puncture there was distinct



[United States Marine Hospital, port of San Francisco, Cal. No. 30, 1899. Name, G. W. H.; age, 18 years; disease, cerebro-spinal fever.]

improvement in patient's condition and a temporary cessation of

Cheyne-Stokes's respiration. Urine nonalbuminous. The following day the latter symptoms returned with increased severity; lumbar puncture was earnestly recommended a second time, but was rejected by the relatives present, and the patient sank rapidly until death occurred on August 5. It was noticed that the heart beats continued for some minutes after respiration had ceased. Autopsy objected to by family.

Treatment in addition to lumbar puncture was the administration of morphia hypodermatically as required for the relief of pain; ice bags to the head and spine continuously, and later iodide of potassium in gram doses was exhibited with forced feeding and stimulation.

The relief afforded the airlining respiratory symptoms in this case by the Quinke lumbar puncture in the first instance makes it a matter of regret that this procedure could not have been fully tried for the further relief of this case.

CASE II.

Cerebro-spinal fever.

B. T. B., aged 18 years; nativity, Missouri; private in Company I, Eighteenth United States Infantry; admitted to the United States Marine Hospital, Port of San Francisco, Cal., July 14, 1898.

Complained of failing health for a month or so passed. Became acutely ill three days ago; the prominent symptoms being severe headache, pain over spine, soreness in calves and knees. Examination showed rigidity of posterior muscles of neck and tenderness over spine. Temperature, 38.4° C.; pulse, 96; respiration, 26. For two weeks following admission patient exhibited no marked change. Pains in head, back, and legs constant and very severe, and not relieved even by morphine. Kernig's sign present.

July 30.—Semicomatose condition developed; pupils moderately dilated; slightly convergent strabismus; urine passed involuntarily. Lumbar puncture was performed at 10 p. m., 45 c. c. of a colorless fluid, slightly clouded with white flakes, being withdrawn. Following day patient's condition not markedly changed, though mind less dull. Pupils a little more contracted; respiration very shallow; urine non-albuminous.

August 3.—Mind clear, but patient very restless and in great pain; pulse very weak and thready.

August 10.—Pain still severe; patient's vocabulary increasing; heretofore unable to speak intelligibly. From this time on convalescence progressed satisfactorily. He complained at times of irritability of bladder. Was discharged in a fair condition on September 3, 1898.

Treatment: In addition to lumbar puncture, consisted of application of ice bags to head and spine, iodide and bromide of potassium

intervals, when possible, of milk, raw eggs, whisky, and bovine. There was complete recovery of speech and every indication of ultimate recovery of health and strength. It is believed that the lumbar puncture was of benefit in this case.

CASE III.

D. P. K.; age, 22 years; nativity, Arkansas; corporal in Company M, Twenty-third United States Infantry; admitted to the United States Marine Hospital, port of San Francisco, Cal., July 15, 1898.

Felt unwell for five days prior to admission. On day preceding admission had a chill, followed by fever, general pains, and sore throat. Anorexia marked; vomited once. Was admitted to the hospital in a state of unconsciousness, which had existed for a period of three days. There was rigidity of neck, retraction of head, and dilatation of the pupils. The following day the patient apparently improved, but had marked pain on swallowing. Had lucid intervals.

July 17.—Marked herpes labialis. On inner sides of both thighs an eruption of cherry-red spots, with small pustular elevated centers. Retraction of head not present. Delirium was marked at this time, during which he eluded the night nurse and escaped from the ward, but was returned in three-quarters of an hour without resistance. Improvement continued until July 27, when pains in head, back, and limbs returned; vomiting also present. Kernigs sign present.

August 1.—Pupils normal. Lumbar puncture performed.

August 3.—Urine normal. Subsequent recovery was uninterrupted until discharge, on September 3. No sequelæ.

Treatment: In addition to lumbar puncture, treatment was largely symptomatic. Morphia was administered hypodermatically for the relief of pain. Ice bags to head and spine. Potassium iodide was administered from time to time in 1-gram doses, peroxide of hydrogen used to cleanse the nares, and enforced feeding of milk, whisky, and bovine at regular and frequent intervals. It is believed that the lumbar puncture was followed by a general improvement in the symptoms of this patient.

CASE IV.

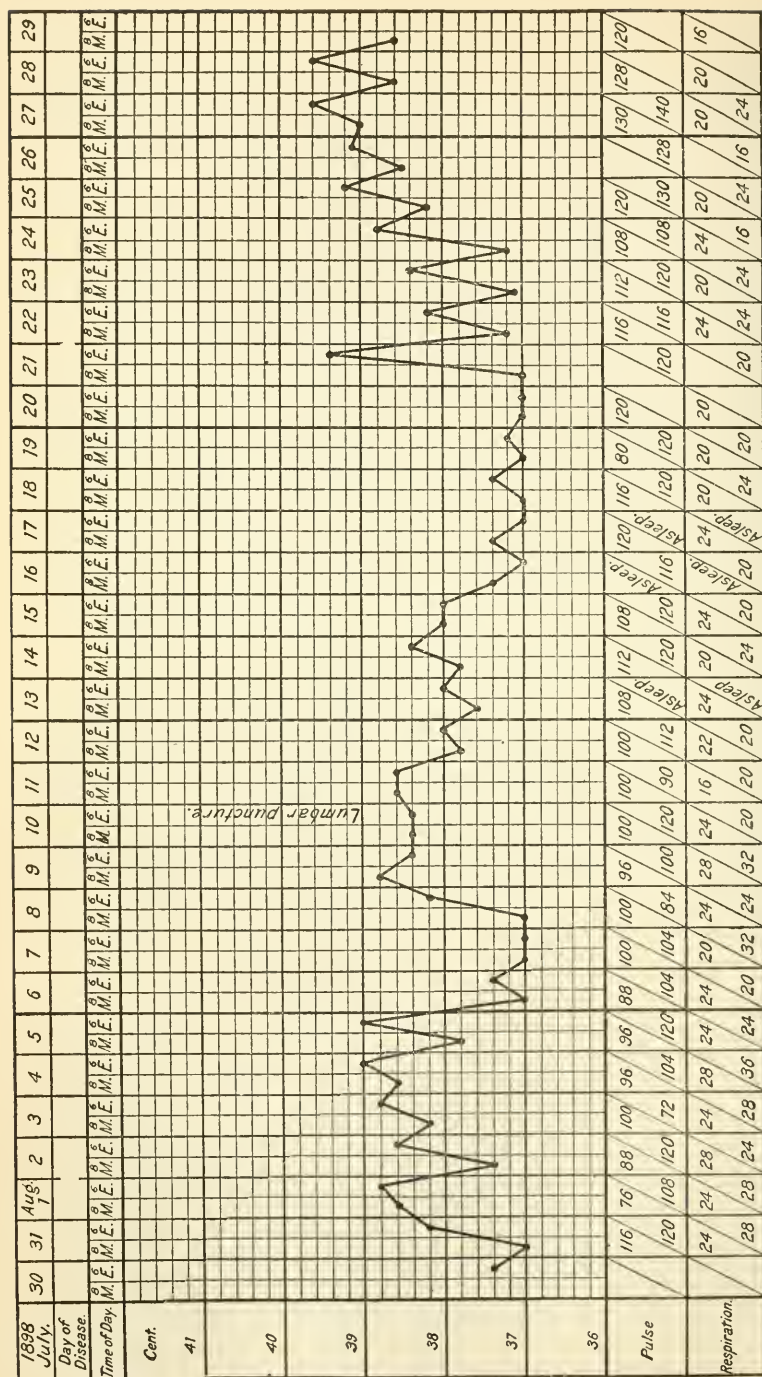
Inflammation of the spinal cord, acute.

E. E. B., aged 36 years; nativity, Maine; residence on board schooner *Reuben L. Richardson*; was admitted to the United States Marine Hospital, port of San Francisco, Cal., July 30, 1898.

Previous history of gonorrhea. Denied lues. A year ago was treated in United States Marine Hospital, Chelsea, Mass., for intercostal neuralgia. Patient had evidently been bedridden for some time, but of this he was reticent. On admission he presented a general anasarca and marked loss of power, with tactile anæsthesia in lower extremities; "girdle sensation" about diaphragm; complete incontinence of feces and marked retention of urine, which required catheterization. Suspicious macular eruption on chest and back. Bedsores over bony prominences of pelvis and external malleoli. Examination of urine negative. Under treatment patient's condition underwent apparent improvement. August 10, lumbar puncture performed; needle being introduced between third and fourth lumbar vertebræ. A considerable quantity of clear, light, straw-colored fluid withdrawn, estimated at 40 c. c. Temperature very irregular, ranging between 39.6° C. and 37° C. Patient was discharged, at his own request, on August 29, condition being somewhat improved.

Treatment: Potassium iodide internally. Otherwise treatment was supporting and symptomatic, viz, systematic catheterization, measures to prevent formation of bedsores, etc. The general tendency was to improvement; although the general paralysis was not materially relieved, the appetite and circulation were much improved.

The patient desired to be transferred to a civil hospital, which was done August 29, 1898, and where he died September 9, 1898.



[United States Marine Hospital, port of San Francisco, Cal. Name, E. E. B.; age, 33. Disease, inflammation of spinal cord, acute.]

CLIMATIC TREATMENT OF TUBERCULOSIS—ESTABLISHMENT OF A GOVERNMENT SANATORIUM IN THE TERRITORY OF NEW MEXICO—SANATORY RANCH, UNITED STATES MARINE-HOSPITAL SERVICE.

By P. A. Surg. GEORGE TULLY VAUGHAN.

It has been estimated that one-seventh of the population of the United States eventually dies from tuberculosis.

In view of the widespread prevalence of this disease, it is not surprising that many cases should be found among sailors—a class thought by many to enjoy comparative immunity.

The Marine-Hospital Service, which furnishes medical attention to the entire merchant marine of the United States, has a clientele of about 150,000, and treats annually over 50,000 cases of disease. Of the total number of deaths which occur annually among these patients, taking the average for ten years, one-fourth, or 25 per cent, are from tuberculosis, many times exceeding the death rate from any other single disease.

So far, medicinal remedies alone have been disappointing, being rarely curative and usually merely palliative in their effects. On the other hand, we know from experience with a number of cases that tuberculosis may be arrested, and, if not cured, reduced to a state of "permanent quiescence" by treatment in a suitable climate, under favorable hygienic conditions. With from 800 to 1,200 cases of tuberculosis to treat yearly, and the poor success that has followed their best efforts to check by medicine the steady progress of the disease to a fatal ending, it is not surprising that officers of the service have turned their attention to a different field, encouraged by the results which have already been achieved by treatment in a proper climate.

The first to advocate the idea of the open-air treatment of the consumptives of the Service in a suitable climate was Surg. Gen. Walter Wyman, who, more than twenty years ago, when a surgeon in the service, endeavored to enlist the interest of the Delegate in Congress from New Mexico in this method of treatment. Little was done, however, until he became Surgeon-General.

Among other officers who have written and studied in the same line are Drs. J. O. Cobb and W. D. Bratton. The latter himself contracted the disease from his patients, and on going to New Mexico to regain his health was directed by the Surgeon-General to prepare a report on the beneficial effect of the New Mexico climate on consumptives,

and to examine all Government property in the Territory with a view to securing a suitable place for a Service sanatorium.

He made an exhaustive report in favor of the climate and the establishment of a sanatorium. Subsequently the Secretary of the Treasury, Hon. L. J. Gage, authorized the detail of an officer of the Marine-Hospital Service to examine the various abandoned military reservations in this arid region and report on their suitability for the purpose of a sanatorium. Passed Assistant Surgeon Cobb was detailed, and after examining many places reported Fort Stanton as the most suitable.

By Executive order of April 1, 1899, President McKinley transferred this reservation to the Marine-Hospital Service, and the buildings are being rapidly repaired, and are now ready for the reception of patients.

Fort Stanton, an abandoned military post, is situated near the Rocky Mountains in Lincoln County, Territory of New Mexico, in latitude $33^{\circ} 29' 27''$ N. and longitude $105^{\circ} 28' 19''$ W. The reservation consists of about 10,240 acres, 8 miles long and 2 miles broad, lying on both sides of the Rio Bonito, which flows into the Rio Pecos, a tributary of the Rio Grande. It is located in the arid region of the United States, 1,400 miles from the Atlantic, 750 miles from the Pacific Ocean, and 600 miles from the Gulf of Mexico. The air-line distance from Washington is about 1,800 miles, from New York 1,900 miles, from Chicago 1,200 miles, and from San Francisco 1,000 miles. The nearest railway station at present is Roswell, N. Mex., on the Pecos Valley Railroad, 25 miles distant, but by the 1st of August the El Paso and North-eastern Railroad will have a branch into Salado, N. Mex., only 6 miles from Fort Stanton and about 150 miles by rail from El Paso.

CLIMATE AND TOPOGRAPHY.

It is generally agreed that an elevated region with a warm, dry, and equable climate is best for consumptives, and Fort Stanton probably comes nearer to filling all these requirements than any other locality in the United States. The altitude may be a little too great, especially for advanced cases. Should this prove to be true, a second sanatorium for the treatment of these cases will probably be established in a region of lower elevation.

The average temperature for the year is about 55° F., 13.3° C.; 93° F., 33.9° C., maximum. It has run as low as 5° F., -15° C., but this is very rare. It sometimes snows, but the snow does not remain long. Fire for heating and winter clothing are needed about three months in the year.

The rainfall is about 20 inches. The average number of days without cloudiness is over 300.

The elevation above the sea level is 6,151 feet. The country is rolling and hilly, gradually extending into the mountains, is covered with grass and alfalfa, which makes excellent grazing for sheep, goats,

and cattle. Higher up is the timber belt, covered with lofty pine, spruce, fir, and cottonwood trees, furnishing abundant material for lumber and firewood.

A few miles above the fort the waters of the Rio Bonito abound in trout. With irrigation, which is already used to some extent and can be provided on a large scale without great expense, all ordinary vegetables, except potatoes and onions, can be raised. The finest fruits grow in and around the reservation.

WATER SUPPLY.

This is obtained from an artesian well 265 feet deep, with a capacity of 15,000 gallons in twelve hours. The water is pumped into a reservoir, whence it passes through iron pipes to the various buildings.

SEWERAGE.

This is only partial, the drainage being chiefly by acequias (irrigation canals).

SOIL.

The soil is a black, alluvial, alkaline deposit, exceedingly rich, with a subsoil of gravel and volcanic stone. Coal fields 5 miles distant, and gold in small quantity.

HEATING.

This is done by means of wood burned in stoves and open fireplaces. It is probable that coal from the mines of Salado, 6 miles distant, can soon be obtained in abundance.

Ever since Koch's discovery that the essential cause of tuberculosis is a special bacillus, and the suspicion which had long existed that it was a contagious disease became a demonstrated scientific fact, a more or less complete isolation of patients afflicted with this disease, with destruction of the vehicle of contagion, the sputum, has been the object of the sanitarian and philanthropist. The result has been the segregation of tuberculous cases in separate wards in all well-appointed hospitals and the establishment of sanatoria for their special treatment, thus protecting the well by preventing their exposure to contagion and providing the best means for the treatment of those already afflicted.

Tuberculous cases now under treatment, or who may apply for relief at any one of the 20 marine hospitals and 120 relief stations, located on the coasts of the Atlantic, the Pacific, the Gulf of Mexico, and the Great Lakes and rivers of the United States, will be sent at Government expense to the Fort Stanton Sanatory Ranch for treatment, where they will not only have the benefit of the climate and mode of life, but of the most advanced and scientific methods of a medicinal nature

from the physicians and bacteriologists selected on account of their special fitness for this duty.

It is hoped soon to obtain a regulation requiring the examination of all sailors before shipping, by which means cases of tuberculosis may be detected, and thus not only would they be given the best chance for recovery by treating the disease in its incipency, but the danger of communication to other sailors by reason of their close and intimate association on ship board would be materially diminished.

The Surgeon-General has in mind not to allow the consumptive patients at the Fort Stanton sanatory ranch to simply sit idle, with nothing to do but to reflect upon their disease, but he hopes to give them all employment of an outdoor character, with the double purpose of diverting their minds from their affliction and of performing labor necessary to the support of the institution. He recognizes, however, that some cases will require absolute rest, and employment or complete rest will be accorded, as may be most suitable, under the direction of the medical officer in charge. It is hoped that in time the institution may become almost self-supporting. The reservation being so great—16 square miles—will permit the raising of sheep and cattle, and the tending of these will give light employment to a number of patients. Light gardening also and the raising of crops will furnish occupation. The alfalfa grass grows in this neighborhood and makes good hay for the subsistence of cattle and horses. The surrounding territory is largely public land, which, when irrigation is established, can be readily tilled. Moreover, it is a mining region, and it is thought that when the patients have apparently recovered they may be discharged to take up public lands in the neighborhood or to engage in the employ of others, relieving the institution of their care. They will thus help to settle this at present unsettled country.

By the establishment of this Government sanatory ranch, therefore, it is hoped to bring about the recovery of a number of patients who would otherwise not recover, improvement in others; the removal of the sources of infection from the numerous marine hospitals, thus abolishing a source of danger to physicians, nurses, and other patients. The removal of this class of patients from the carriers of commerce and the prevention of the infection of the fore-castle and other apartments occupied by the crews will thus aid in the great movement which seems to be initiated at this end of the nineteenth century toward suppressing this great destroyer of the human race.

NOTES ON SURGICAL CLINICS IN BERLIN, PARIS, AND LONDON IN JUNE, 1899.

By P. A. Surg. GEORGE T. VAUGHAN.

The tuberculosis congress having adjourned, in accordance with instructions I visited some of the principal surgeons in Berlin and their hospitals. These were Professors von Bergmann, König, and Dr. Casper. Professor von Bergmann has a wealth of material and still operates with his old dexterity and rapidity. He has three surgical stations in the Royal University Hospital, containing an aggregation of 180 beds, including men, women, and children. The polyclinic is the office to which all patients first apply, the slighter cases being treated and minor operations being done here, while more serious cases are sent to the wards. I was told that about 20,000 cases were treated here during the year.

Professor von Bergmann holds personally a surgical clinic in the amphitheater of the hospital five days in the week, from 2 till 4 o'clock p. m. The amphitheater and operating arena are of wood, the former having about 120 seats for students, and both are lighted by windows overhead. The strictest precautions are used in the way of asepsis and antiseptics.

The Röntgen ray is used in all cases where it is thought to be necessary in fractures and dislocations. Fractures of the patella are usually treated by wiring; fractures of the neck of the femur, by extension and counter extension in the straight position—later with plaster of paris; for the radical cure of hernia, Bossini's operation is usually done—sometimes Koch's. Occasionally the Murphy button is used in making intestinal anastomoses. I saw one case in which it had been used after resection of a meter of intestine for gangrene from strangulated hernia, with perfect recovery. In colostomies the professor prefers making the opening on the right side, in the cæcum. His experience has shown it to be satisfactory.

Professor König is chief of the surgical division in Chariti, a hospital of 2,000 beds, the surgical division containing about 280. The surgical amphitheater contains 120 seats, and is divided equally by the operating arena, which runs completely across. The light is furnished by large windows on one side. The usual precautions against infection are taken.

Professor König prefers his own operation for hernia and does not use the Murphy button for intestinal anastomosis, preferring to unite the ends by two layers of sutures. He operates on fractures of the

patella, but does not use metallic sutures, preferring catgut, after drilling the bone. The Röntgen ray is used whenever indicated, usually before and after reducing a fracture or dislocation.

For points on genito-urinary surgery I went to see Dr. Leopold Casper. Dr. Casper treats gonorrhea with permanganate of potassium, somewhat after Jouvett's method. In the later stages he frequently uses nitrate of silver.

Dr. Casper uses the cystoscope almost daily in making the diagnosis of diseases of the bladder, and the ureter cystoscope frequently when the kidneys are affected or there is doubt as to which kidney is the seat of the disease. I saw one case of pyelitis of both kidneys which had been caused by injections of solution of nitrate of silver (1 to 1,000) into the pelves by means of the ureter cystoscope. The injections were made every three or four days and produced little or no pain. The cause of the pyelitis was thought to be gonorrhea. Dr. Casper told me that he had treated the patients so affected, all males, with the same happy result. He treats buboes, gonorrheal or chancroidal, by excision or by opening and injecting nitrate of silver, 1 or 2 per cent.

I visited the international exposition of devices and methods for the cure of the sick in Berlin, and while there were a great many useful remedies and apparatus, there were none of importance which are not known and used in the best equipped hospitals.

My next visit was to Berne, Switzerland, to see Prof. Theodore Kocher, the chief surgeon of the Inselspital and professor of surgery in the Hospital of Berne. It seems surprising to find a man of his varied accomplishments and wonderful surgical knowledge and skill buried in a town of 45,000 inhabitants, but his light is not hid under a bushel. On the contrary, it has shed his light abroad wherever surgery is taught. Having studied under Billroth, he is a worthy pupil of that celebrated master. This surgical division is constructed to hold 110 beds, but nearly always contains many more. A Röntgen-ray outfit is attached and all fractures and dislocations except those of the most trivial character are skiagraphed before reduction and afterwards as often as may be necessary. The operating amphitheater has seats for about 120 students, the light coming from overhead and from one end of a short passage, which divides the seats of the amphitheater into two halves. Both sexes are taught together.

Professor Kocher uses soap and water, bichloride solution, and lysol for cleansing his hands, and often wears sterilized cotton gloves while operating. The instruments are boiled in a solution of soda. As an anæsthetic he usually gives ether.

His surgical experience is something enormous. As an operator on goiters he is easily ahead of any surgeon in the world, having removed 1,456. He usually removes the thyroid by means of a curved incision across the front of the neck, the convexity of the curve being below, enucleates the cyst, or separates the tumor from its attachments, and

ties the bleeding points, from 25 to 40 ligatures being often used. A portion of the gland is always left, but in spite of this tetany occasionally occurs. He mentioned one case which lasted a year after the operation before finally recovering.

As an anæsthetic for this operation he usually uses a 1 per cent solution of cocaine injected carefully into the skin and then under the skin. He sometimes operates on cases of exophthalmic goiter when thyroid extract has failed, removing one side of the gland and ligating one of the thyroid arteries on the opposite side, often with good results.

Professor Kocher's operation for the radical cure of inguinal hernia, while not equal to that of Bossini in point of general adaptability and efficiency, is an excellent operation in certain cases. I saw him perform a great many operations, but I shall select only one for complete description, namely, a case of extirpation of the stomach and a portion of the transverse colon. The patient was a woman of about 45 or 50 years of age, with cancer of the pylorus and almost the entire stomach. Operation lasted two hours and fifty minutes, under ether. Through an incision from the ensiform cartilage to the navel he drew the stomach and transverse colon, which were welded together by means of the disease, outside of the abdominal cavity. He then separated the stomach from the spleen by tying on both sides and dividing between the ligatures, the vessels, etc., of the gastro-splenic omentum, and the layers of the great omentum from the stomach and colon in the same way. The transverse colon was then seized with long joined clamp forceps, two pairs on each side of the diseased portion, with just sufficient space to cut between the two pairs at each end. The section was made and each end of the gut, the portion to be removed as well as that to be retained, cauterized with the actual cautery to prevent infection from the intestinal mucous membrane. All four ends were then wrapped in gauze and secured by forceps until the stomach could be detached. This was done by separating it carefully from the lesser omentum, preserving the duætus communis choledochus, and from the pancreas, using many ligatures. The duodenum was then clamped just below the pylorus by two pairs of forceps and divided between, as in the case of the colon. The œsophagus was clamped in the same way just above the cardiac orifice and divided, but not cauterized. This permitted the removal of the entire stomach with about 4 inches of the attached transverse colon.

The end of the duodenum was then unwrapped, brought up, and sewed to the œsophagus by two rows of continuous silk sutures, the posterior surface being united before removing the clamp forceps by stitching the serous surfaces together, then passing the sutures through all the coats just below the forceps. This united the posterior halves of the duodenum and œsophagus. The clamps were removed and the forceps reversed in order to unite the anterior halves and thus com-

plete the circumference of the tubes by joining the edges by sutures through all the coats and then uniting the serous coats. The two ends of the colon were united in the same way. There was no irrigation of the abdominal cavity, the viscera being simply wiped off with gauze and the wound closed by two continuous silk sutures, the first uniting peritoneum, fascia, and muscles, and the second the skin. A small glass drainage tube was then introduced simply to the space between the muscles and the wound sealed with collodion over a piece of gauze.

The patient's condition was fairly good, pulse 125 at the end of the operation. She did well for about twenty-four hours, then developed peritonitis and died three days after the operation. The necropsy showed perfect union between the duodenum and œsophagus, but a minute spot of necrosis at the colon joint.

PARIS.

In Paris I visited the following hospitals: Neckar, Hotel Dieu, St. Joseph's, La Pitie, and the Military Hospital (Val de Grace), meeting Professors Alboran, Le Dentin, Le Beck, Berger, and Bronardel, and the military surgeons Colonel Madames and Lieutenant-Colonel Ninier. Professor Alboran operates at the Neckar Hospital, and is quite skillful in his specialty, genito-urinary surgery.

All the hospitals mentioned except St. Joseph's are old and rather the worse for wear, but the results obtained appear to be quite satisfactory.

The Hotel Dieu, one of the oldest in Paris, occupies a block on the Il de la Citie next to historic Notre Dame. It is four stories high and has 650 beds, including medicine, surgery, gynecology, and obstetrics. Some of the wards have a capacity for 48 patients, others from 4 to 8—the wards generally overlooking a courtyard. The building is heated by steam through radiators. The operating room seemed ancient and inconvenient both to the operator and the students.

St. Joseph's Hospital is about 14 years old and much more modern than any of the others. It occupies considerable ground, probably 5 acres, and consists of several buildings connected together by long covered verandas. The buildings are of brick; the main one four stories high, the others two. Capacity, 300 beds, of which 100 are surgical. Professor Le Beck told me it would soon be enlarged. Professor Le Beck is the chief surgeon of this hospital and performs all kinds of operations, including gynecology in general surgery. His treatment of fracture of the patella is to wire by the open method. He uses the Röntgen ray whenever necessary.

The Military Hospital (Val de Grace) is a large stone building, built by Louis XIII, and first used as a monastery, but it is now

used as a hospital for sick and injured soldiers and sailors and is a military medical school. It has 850 beds, and by a little crowding will contain 1,000. The building is four stories high, with several wings. The wards are large, the most of them containing 48 beds, and are heated by stoves. There are 40 rooms for officers. The kitchen was very large, with excellent cooking facilities. There are two rooms for operations—one for septic or infected cases, the other for aseptic cases. The latter is well arranged with tiled floor and calcimined(?) walls, which can be washed. It is heated by a stove and lighted by electricity. No drainage in the room.

The ordinary contagious diseases are not received here, and tuberculous cases are not kept here except for operation in cases requiring it. Precautions against infection are taken by using spit cups containing a germicide, but not by segregation. Lieutenant-Colonel Ninier told me that they treated fractures of the patella by wiring. The Röntgen ray was frequently used in fractures, an apparatus being in the hospital. He had seen no burns from it.

There are seven professors and seven assistants in the medical school. At the end of the course the students are examined and if successful receive appointments as physicians in the army, with the rank of sublieutenant.

One of the best surgeons in Paris, especially on hernia, is Prof. Paul Berger. His work "Results of the examination of 10,000 cases of hernia," is one of great value. He operates at La Pitie, and is extremely careful about preserving asepsis, wearing a gauze screen over his nose and mouth while operating to avoid the danger of infection from the saliva in talking or the respiratory current in expiration. He prefers Bassini's operation, or a modification of it, in inguinal and femoral hernia, and believes in operating on fractures of the patella and suturing with silver wire.

LONDON.

In London I visited principally the University College Hospital and studied the methods of Professors Godler, Barker, and Horsley. The name of Victor Horsley is well known to Americans in connection with his work on the brain and spinal cord, but he does not confine this operation to the nervous system, and includes hernias, appendicectomies, thyroidectomies, etc., all of which he does in his usual thorough and careful way. Professor Barker is a man of great experience in surgery, and his name is connected with at least two operations, one for the radical cure of hernia—though he now prefers Bassini's operation modified by simply ligating the hernial sac and not dissecting it out—the other, Barker's operation for fracture of the patella, by means of a silk ligature passed subcutaneously around the fragments. The latter, he informed me, he had performed once, and

his usual method is to open the joint and wire the fragments together.

He prepares his hands for operations by washing well with soap and water and then with methyl alcohol.

Some of Professor Barker's cases were of sufficient interest to justify mention.

CASES.

No. 1.—A man about 55 years of age with sarcoma of the right scapula. Excision of the entire scapula by an incision along the vertebral border joined by one at right angles along the spinous process of the joint; deltoid and trapezies stitched together with continuous silk suture and the wound closed without drainage. Patient died about a week later from sarcoma of the lungs. Mr. Barker kindly took me through his wards, and the following cases impressed me:

No. 2.—A woman about 35 years of age, operated on four weeks ago for strangulated inguinal hernia of the left side, with gangrene, requiring excision of 18 inches of small intestine; ends united by silk sutures and gauze drain left in. Patient is now convalescent.

Case 3.—A young man operated on for inguinal hernia of the right side, under the influence of cocaine anaesthesia only; Bassini's operation; patient well.

Case 4.—A young man operated on two or three weeks ago for strangulated inguinal hernia, with gangrene, requiring the resection of 1 yard of small intestine. Patient recovered without trouble, except a stitch abscess.

Case 5.—A man, aged 32, with obstruction of the bowels. Laparotomy disclosed enormous distention of the small intestine with collapse of the large intestine, and a hard mass in the caecal region. An opening was made in the distended small intestine, 5 pints of fecal matter evacuated and the opening closed. An anastomosis was then made between the transverse colon and the ileum in order to reestablish the fecal current, and the abdomen was closed. About two weeks later an incision was made over the cœcum; it was excised, the open ends of the colon and ilium closed by turning the surfaces in and suturing, and a lateral anastomosis established between the two. Recovery followed.

Case 6.—A woman aged 32 years who has been treated and supposed to have been cured a year ago of gastric ulcer was taken with vomiting and severe pain in the stomach. Exploratory laparotomy showed perforation of the anterior wall of the stomach near the pylorus and the contents of the stomach in the abdominal cavity. He first sponged out the cavity, not irrigating, then closed the opening and sewed a piece of omentum over it, put in gauze drains and closed the abdominal cavity, leaving space for the projection of the gauze. A week later the patient was doing well and bade fair to recover. Mr. Barker said this was his eleventh operation for perforating gastric

ulcer, with six recoveries (including this case) and five deaths. Mr. Barker considers silk sutures safer than the Murphy button in making intestinal anastomoses, except possibly in inexperienced hands. He thinks he has seen two cases in which it contributed by its weight and pressure to the death of the patients.

Mr. Barker performs a great many operations under local anæsthesia with cocaine 1 to 1,000, including hernias, gastroenterostomies, etc. I saw him use it in a case of appendicectomy operation for the radical cure of hernia, excision of the thyroid gland, and excision of portions of the internal saphenous vein. He does not use enough of the solution to give a patient over 2 or 3 grains.

In only one of the four cases mentioned could the experiment be considered perfectly successful, namely, in the varicose vein these sections were clamped and excised with no evidence of pain. In the other cases, however, enough was shown to prove that the method is practicable except in nervous and timid persons.

For genito-urinary surgery I went to St. Peter's Hospital to see especially Reginald Harrison and Henry Fenwick. Mr. Harrison's work in this line is well known, as he has for many years been a leader in this branch of surgery. Mr. Harrison recently (in 1897) recommended reni puncture in nephritis with albuminaria. He reports three cases in which it produced or aided in producing a cure. Instead of castration for hypertrophied prostate, he does vasectomy with good results. He has done about 200 cases.

For gonorrhea he thinks the best method of treatment is the Jouet or some modification, especially nitrate of silver in chronic cases.

Mr. Henry Fenwick is a younger man, but has done a great deal of good work in this line of genito-urinary surgery. He emphasizes the diagnostic importance of the appearances of the mouths of the ureters as seen through the cystoscope. Thus an irregular dilation of the mouth of one ureter indicates tubercle of that side; a regular smooth uniform dilatation indicates excessive action of the kidney; and a protruding or prolapsed mouth indicates obstruction, as a stone in the ureter or kidney.

Of great importance is a fixed pain in the glans penis, perineum, one testis or ovary, with corroborative symptoms in making the diagnosis of stone in the kidney. After the operation of internal urethrotomy it is Mr. Fenwick's custom to introduce a good-sized rubber catheter into the bladder and leave it in for three days. He has proved by experiment that the patients are less likely to have chills than when no catheter is used. For enlarged prostate he does vanotomy single or double, and, after an experience of 80 cases, he believes it is as effectual in reducing the size of the prostate as castration.

Cases of vesical calculus, I need scarcely say, are treated by litho-

lapaxy (Bigelow's operation) unless on account of the size and hardness of the stone, advanced disease of the kidneys, or bladder requiring drainage. Probably the best collection of vesical calculi in the world is that presented by Sir Henry Thompson to the Hunter Museum in the Royal College of Surgeons. It consists of about one thousand cases—the specimens from each case being conveniently placed in a small glass receptacle and labeled with a number which corresponds to a number in a book which contains a short description of each case. The calculus removed from Emperor Napoleon III is in this collection.

The two largest stones in the collection were removed by the suprapubic method, one weighing 14 ounces, the other a little less; the patients were 62 and 71 years old and recovered without difficulty.

HISTORY OF A CASE OF ARSENICAL POISONING, FOLLOWING INGESTION OF "ROUGH ON RATS."

By P. A. Surg. W. J. S. STEWART.

William Johnson, hospital permit No. 59, aged 30 years, colored, a native of South Carolina, was admitted to the United States Marine Hospital at Vineyard Haven, Mass., on January 10, 1899, at 2.30 p. m., suffering from arsenical poisoning, following the ingestion of an unknown amount of "rough on rats," and died the same evening at seven minutes after 10 o'clock.

History on admission.—Johnson was employed as cook on the four-masted schooner *Chas. E. Balch*, which vessel put into the harbor of Vineyard Haven on account of head winds on January 8, and laid at anchor just within the mouth of the harbor, some 2 miles distant from the hospital.

According to Johnson's statement, made to Junior Hospital Steward F. J. Herty, Marine-Hospital Service, immediately on admission, he had that morning, about 9 o'clock, accidentally knocked a bottle off of a shelf in the galley of the schooner *Chas. E. Balch*. This bottle, he stated, contained "rough on rats," and in an "insane moment" he took about a teaspoonful of this—"maybe more," he added—and put it in a cup of water and drank most of it.

When he "came to himself" he notified the captain of the schooner of what he had done, and the captain administered an emetic of mustard, followed soon afterwards with a large draft of soapsuds. This soon produced emesis, to the extent, he stated, of a "bucketfull." After the emetic had acted his bowels moved copiously. Nothing further could be obtained in the way of history from him except that he insisted strenuously that the poison was taken in a moment when he was "crazy." In contradiction of this, however, he informed the acting nurse that he had taken the poison because he was "tired of cooking."

The above statement of the patient does not differ materially from that made by the captain of the schooner *Chas. E. Balch* in reply to an inquiry on the subject addressed to him from this office.

Following is his letter:

PORTLAND, ME., *January 18, 1899.*

DEAR SIR: I received your letter of January 14 on my arrival here this morning. William Johnson was shipped as a steward on board schooner *Chas. E. Balch* in Philadelphia, and was on board the vessel eight days. Tuesday morning, January 10, at 9 o'clock, he told the sailors he had taken a quantity of "rough on

rats," and asked how long it would take to kill him. One of the sailors told the second mate, who informed me at once. I gave Johnson an emetic, and later flour and water, and finding he was growing worse I landed him in the Vineyard at 2 o'clock.

I could not ascertain how much he had taken, and the only thing he would say was that he wanted to die and had taken enough to kill him. He apparently did not feel the effects of the poison until about 12 o'clock.

Yours, truly,

W. J. STEWART, M. D.,

Passed Assistant Surgeon, U. S. M. H. S.,

In Command of Station, Vineyard Haven, Mass.

W. G. CROCKER,

Master Schooner Chas. E. Balch.

In this connection I would state that I have experienced great difficulty in finding out the chemical composition of the rat poison known commercially as "Rough on rats." Inquiry of the bureau of the Massachusetts State Board of Health, which board I had been informed had at one date made a chemical analysis of the substance in question, and of the chemical laboratory of the University of Virginia all failed to elicit anything in the nature of positive information. Nor is the chemical composition of the poison contained in any of the works on toxicology at my command. A letter addressed to the manufacturer of the ratsbane, however, obtained the following reply, containing a certain amount of information on the subject:

JERSEY CITY, N. J., *January 30, 1899.*

DEAR SIR: Replying to yours of the 25th, in absence of Mr. Wells [the manufacturer is E. S. Wells, 710-712 Grand street, Jersey City, N. J.], who is sick, will say that there is 50 per cent arsenic used in our preparations: no phosphorus used at all.

Yours, respectfully,

E. S. WELLS.
B.

W. J. STEWART, Esq.

By the use of the word arsenic above is presumably meant arsenious oxide or acid, As_2O_3 , although, according to Reese, the metal combined with the oxide is mixed and sold as a fly poison.

The mention of phosphorus in the above letter was called forth by an inquiry of mine as to whether or not there was any phosphorus contained in the preparation, as I had been informed there was.

Arsenious acid is but sparingly soluble, cold water not taking up more than half a grain to the ounce, boiling water about twenty-four times that amount. It is presumable, however, that the poisonous dose in question was added to cold water, and as a consequence it is impossible to surmise just how much, or even to approximate the amount taken by Johnson.

According to the percentage of arsenic contained in the preparation, a dram—the rough equivalent of a teaspoonful—would represent 30 grains of arsenic, but as it is virtually insoluble it is hard to say how much of the amount was taken—possibly the greater part. Consequently, as I stated above, the amount ingested can only be

surmised with great uncertainty. It was probably in the vicinity of 30 grains. While, on the other hand, if the teaspoonful was a heaping one, or if more than one teaspoonful was taken, and if he drank it down—as he probably did—before the powder had time to settle, he must have taken into his stomach a very much greater amount.

Clinical history.—The only statement as to symptoms which appeared before the admission of this man to the hospital which could be obtained was that for two hours or thereabouts vomiting and purging had been almost incessant. It was on this account doubtless that the man was landed and sent to the hospital. The captain states in his letter that Johnson did not begin to feel the effects of the poison until about 12 o'clock noon, some two and a half hours before he was landed at the wharf, and about three hours after taking the "rough on rats." This time, according to toxicologists, is somewhat later than is usual for the appearance of symptoms in cases of arsenical poisoning, but the elongation of the period was probably influenced by the emetics and demulcents administered by the captain.

On admission to this hospital, at 2.30 p. m., the patient was in a collapsed condition, although he had been suffering with marked symptoms for only two and a half hours. The radial pulse was imperceptible, and the pulsations of the heart could be felt but very feebly—about 146 per minute. The skin of the whole body, especially that of the extremities, was cold to the touch, but was not clammy. There were bloody stains about the nostrils, the source of which I was at that time, as well as subsequently, unable to learn. The patient stated to me that he had a feeling of impending death, and was quite conscious that he could not recover.

Vomiting and involuntary alvine discharges of watery, flocculent fluid had been constant for almost two hours, and on admission his drawers, trousers, shoes, and socks were so drenched with these discharges that on being supported from the ambulance to the dispensary, where he was first carried, the matter oozed from his shoes at every step. Vomiting on admission was almost continuous, but not painful, the vomitus being of a greenish-yellow color and of no perceptible odor. At this time the patient experienced no pain anywhere, had had no cramps, and complained only of very great weakness, cold, and intense thirst.

Freshly prepared hydrated sesquioxide of iron was at once administered in quantity, together with demulcents, while nitroglycerine and strychnine were freely exhibited hypodermatically.

Nothing, however, administered by the mouth was at this time retained for more than a few moments. This treatment, together with hot-water bottles to the extremities and a sufficiency of covering for the bed, constituted all that could be done, and was recognized from the first as in all probability likely to be unavailing.

About 5 o'clock—eight hours after taking the poison—cramps in the calves of the legs were added to the symptoms already related, and while they continued until coma was established, they were not of any great severity. There also commenced about the same time some slight abdominal tenderness and some tenderness and soreness on deep pressure in the epigastric region. From this time until the moment of death, five hours later, all other symptoms related above increased, thirst and weakness especially, the latter terminating in coma about an hour before death. Control of the sphincters progressively diminished and was finally entirely lost. The action of the heart became more and more feeble, and repeated hypodermatic administration of nitroglycerine failed to call forth any response from that organ. The pain and tenderness spoken of above did not increase; there were in all but few cramps and of but mild severity; there was neither paralysis nor convulsions nor impairment of the clearness of the mind or perceptive faculties. The patient was at no time disposed to talk, but lay in bed, covered up, head and body, with the bedclothes; no suppression of urine, no tenesmus; only, as stated above, the symptoms in evidence above all others were those of prostration and shock.

About an hour before death this weakness appeared to merge into unconsciousness, and he died in coma at seven minutes after 10 o'clock the evening of the day admitted, nine hours and twenty-three minutes after admission, ten hours after—according to the statement of the captain of the schooner on which Johnson was employed—the symptoms of arsenical poisoning first showed themselves, and about thirteen hours after the ingestion of “Rough on Rats.”

Necropsy (twelve hours after death).—Body of a poorly nourished colored man; weight, about 115 pounds; height, about 1.675 m. No scars or other distinguishing marks on body. Post-mortem lividity not noticeable; post-mortem rigidity marked. Brain not examined. Examination of thoracic cavity: The pericardial sac contained a normal amount of fluid and was normal in appearance. The heart was small; weight, 240 grams; normal in outward appearance. The left ventricle was distended with dark-fluid blood. No abnormality visible about the heart or any of the large vessels, except that on the free border of the mitral valve there were two small calcareous deposits, in size about that of No. 8 bird shot.

The right lung weighed 530 grams and was deeply congested throughout all the lobes. The pleura was adherent everywhere, so that it was with great difficulty that the lung could be removed. There was no evidence, however, of tubercular or any other abnormal condition of the lung tissue.

The left lung weighed 410 grams, and the condition of the lung tissue and pleura was identically the same as that of the right lung.

The cesophagus, after ligating at its lower portion, was opened and found to be in a state of intense congestion.

Examination of the abdominal cavity: The abdominal cavity was opened by the usual incision, and its contents viewed before removal or interference. The omentum and the smaller bowel showed in situ marked evidence of inflammation and congestion, and the course of the mesenteric vessels—the *vasa intestini tenuis*—was as clearly marked as in a specimen prepared by injection. The liver was held out of the way and a ligature was passed around the œsophageal end of the stomach and one around the duodenum about six inches from the pylorus, and by this means the stomach and a portion of the duodenum were removed with contents intact for examination. A similar proceeding enabled the removal of the greater part of the small intestines with its contents.

The spleen, small, was congested, and the capsule somewhat adherent; otherwise the organ appeared normal.

The left kidney, weight 125 grams, was deeply congested, capsule adherent; otherwise normal.

The right kidney weighed 100 grams, deeply congested, with adherent capsule. The entire pelvis of this kidney was occupied by a calculus weighing 4 grams, with exceedingly sharp, serrated edges. The removal of the calculus showed a cavity extending downward from the pelvis, capable of holding about 20 c. c. of urine. This cavity was full at the time examined and the removal of the stone caused its evacuation.

The supra renal capsules were smaller than normal, but were not otherwise abnormal.

The urinary bladder was not removed, examination in situ, by an incision, revealed nothing abnormal. It contained about 30 c. c. of urine. There was no appearance of congestion in the condition of the mucous lining of the bladder.

Organs of generation not specially examined.

The rectum was pale, otherwise normal. (In cases of arsenical poisoning the rectum is said to be often inflamed, while the upper portions of the colon are rarely observed to be so.)

The stomach and upper portion of the duodenum: The stomach after removal, as stated above, was evacuated of its contents by the removal of the ligature at the pyloric end, the contents being received into a vessel. It was then opened along the lesser curvature. A condition of intense congestion was found, increasing in intensity toward the pyloric orifice, just before reaching which, on the floor of the stomach, was a spot, almost triangular in outline and about 5 cm. in each direction, where the congestion appeared to have reached its maximum degree. The lining membrane here was deep claret color, and the line of demarcation was surprisingly well defined. The membrane here was much softened and could easily be separated from the deeper tissues, and it is probable that had the patient lived sufficiently long ulceration would have occurred at this point. The

membrane of the stomach was, as noted above, congested throughout, the rugæ were sharply defined, and in many of their folds a yellowish substance mixed with mucus and quite adherent to the membrane could be observed. Toward the pylorus there were several patches of this character. According to some toxicologists this yellowish substance consists of arsenious acid mixed with lymph and mucus. It is certain in this case that such was the fact, as a scraping from one of these spots, examined chemically for arsenic, proved its presence. The mucous surface of the stomach appeared to be slightly thickened in some portions, not, however, to any great extent.

The contents of the stomach, as well as those of the upper portion of the intestinal canal, consisted of a dark reddish yellow fluid, odorless, which on standing deposited a sediment about one-quarter as much in amount as the total amount of the fluid (which was about 500 c. c.), composed of disintegrated bits of mucous membrane, mucus, and the yellowish white substance above referred to.

The upper portion of the small intestine was much congested and showed, especially in the duodenum, the same changes as the stomach. These appearances gradually diminished as the termination of the lesser bowel was neared and were entirely absent from the colon, the latter being flaccid and pale, and presenting a striking difference in appearance to the upper portion of the alimentary tract. The upper two-thirds of the small intestine contained a fluid similar to that found in the stomach, but not of such high coloring. Along the course of the bowel the solitary and agminated glands were seen to be swollen, while those in the mesentery were also considerably enlarged. The liver weighed 1,110 grams, and was deeply congested, but otherwise normal to macroscopic appearance. The gall bladder was normal and contained about 10 c. c. of bile. Cord and membranes not examined.

Chemical examination of contents of stomach.—A scraping—in amount about 4 or 5 drops—from one of the yellowish patches on the mucous membrane of the stomach, to which I have referred above (the particular patch from which the scraping was taken was toward the pylorus), was placed in a small glass graduate and 30 c. c. of water added. This was well stirred and a few drops of the mixture introduced into Marsh's apparatus for the detection of arsenic quickly showed the presence of the metallic poison.

All apparatus used in the test were first tested to prove their non-contamination with arsenic.

GUNSHOT WOUND OF THE FACE—RECOVERY.

By P. A. Surg. J. H. OAKLEY.

C. R., aged 29; nativity, Kentucky; admitted to the United States Marine Hospital, Evansville, Ind., November 16, 1898; discharged, recovered, December 5, 1898.

Patient was shot while acting as deck hand on the steamer *New South*. The bullet, of 32 caliber, entered the left cheek 3 cm. anterior to the external auditory meatus, passed under the zygomatic process of the temporal bone, through the sigmoid notch of the inferior maxillary bone, across the zygomatic fossa, through the left antrum of Highmore, across the nasal fossæ, perforating the septum, and made its exit on the right side of the nose about 3.5 cm. below the inner canthus of the right eye. Hemorrhage had ceased some time before he entered the hospital. Both eyes were closed as a result of the punishment he had received before being shot. The wounds were cleaned and dressed. Two pieces of bone were removed from the wound of exit on the 24th ultimo, and both wounds were healed by the 1st instant. There was no rise of temperature. His eyes gave him more trouble than the bullet wound. This case is of interest because of the small amount of inconvenience caused by the bullet, and because of the narrow escape he had from receiving a fracture of the inferior maxillary bone and injury to the left eye.

REPORT OF THE CRUISE OF THE U. S. S. McCULLOCH, NEW YORK TO HONGKONG, MANILA, AND SAN FRANCISCO, WITH ACCOUNT OF THE BATTLE OF MANILA BAY.

By P. A. Surg. JOS. B. GREENE.

Pursuant to Department orders I joined the United States revenue steamer *McCulloch* at Philadelphia on December 7, 1897, and reported to Capt. D. B. Hodgson for duty and assignment to quarters. The *McCulloch*, a composite type of vessel, had recently been completed at Cramps' shipyard for service at the San Francisco station. Her decks were entirely unprotected and most of her machinery was above the water line. She had a displacement of 1,280 tons, draft 14 feet, and length 219 feet. Her engine was triple expansion, and she was capable of a speed of 17 knots. She was provided with a distilling plant and an electric lighting system with a searchlight. She was heated by steam, but was not provided with an ice plant. Her armament consisted of four 6-pounder Hotchkiss rapid-fire guns. There was no sick bay, nor a suitable space provided for medicines. The drug locker was on the lower deck aft, most inconveniently situated.

On December 12 the ship was formally placed in commission, and on December 17 we left Philadelphia for Baltimore, where her equipment was to be completed. After stopping at Norfolk for coal, we arrived at Baltimore December 26. Leaving Baltimore January 9, we arrived at Norfolk, the following day, where we refilled our bunkers and took on an additional deck load of coal. Our ship's company at this time consisted of a crew of 63 men, 11 officers, and 4 guests, one of the latter acting as disbursing agent.

On January 12, under the escort of the revenue cutters *Windom* and *Hamilton*, we left the Chesapeake on the voyage, which we expected to last four months. We encountered rough weather from the beginning of our voyage, and it continued until we arrived at Punta Delgada (Azores), fourteen days later. The first few days of the voyage were utilized in vaccinating the crew with virus sent from the Bureau, and I was fortunate in securing a good percentage of "takes." Remaining at the Azores long enough to take on coal and make a few repairs to the engines, we arrived at Gibraltar on February 7. While there I visited both the colonial hospital and British military hospital, the latter through the courtesy of Surgeon Captain Austin of the British army. I saw with him a number of interesting cases, among them cases of Malta fever.

The town of Gibraltar is a model as regards its sanitary conditions,

every precaution being taken for the prevention of epidemic diseases. The necessity for these measures is the more urgent on account of the overcrowding of the population on a limited habitable area.

On February 16 we arrived at Vallella, Malta. Here the news of the horrible destruction of the *Maine* reached us. Naturally it had a depressing effect on the entire ship's company. Malta being the headquarters for the British Mediterranean squadron, we found a number of Her Majesty's ships in the harbor. While here I was privileged to see, in company with Surgeon Major Hayes, of the British army, a number of cases of Malta fever. In passing through the ward I was struck with the cheerful expression on the faces of the patients as compared with the "typhoid expression." Saw the temperature chart of a patient whose fever had continued for ninety-one days. I was informed that the mortality in these cases was low, although relapses were common. The treatment is symptomatic, with special attention to the proper nourishment of the patient. A ward in the military hospital, formerly used by the Knights of Malta, is 970 feet in length, and 50 feet in height.

On February 22 we left this beautiful island with regret, and on February 26 arrived at Port Said. Remaining here long enough for a party to return from a visit to Cairo, we started through the Suez Canal, anchoring the first night at Ishmalia, midway the canal. The following afternoon, having passed through the canal, we were lying off Suez. Our course now, through the Red Sea, was almost due south, and everyone began to feel the great change in temperature. On March 11 we arrived at Aden.

While here one of the machinists became seriously ill with cellulitis of the forearm, that showed no tendency to limit itself. After a consultation with Surgeon Nepean, of H. M. S. *Raccoon*, I advised that the patient be left in the civil hospital. As much as we regretted to leave a member of our crew behind, it seemed the only course to pursue, in view of our anticipated cruise in a still warmer climate, and the absence of such articles of food as are required in these cases.

The patient subsequently recovered and was returned home, and ordered to the *Algonquin*.

At Aden I made inquiries into their quarantine methods, especially as regards plague, which was then raging in Bombay. Passengers wishing to land are detained during the required period of incubation, and their clothing and baggage properly disinfected. Through steamers are allowed to take on coal from a barge alongside, handled by the ship's crew, even if cases of plague have broken out aboard ship.

Leaving Aden March 17 we encountered a northeast monsoon, and had delightful weather until our arrival on March 26 at Colombo, Ceylon. In conversation with the health authorities here I learned that they had little dread of plague in spite of their close commercial

relations with Bombay. They considered the latitude in which they lived unfavorable to the spread of the disease. Smallpox was not a quarantine disease, on account of the almost universal practice of vaccination on the island. The general hospital is beautifully situated in a palm grove, and is a great boon to the natives. It is in charge of the English medical authorities.

Arriving at Singapore on April 8, the captain of our vessel found cable orders awaiting him, directing him to report at Hongkong to the commander of the Asiatic Squadron. We therefore remained here only a few days, and on April 17 reached Hongkong, where the *McCulloch* became attached to the Asiatic Squadron.

The fleet, under Commodore (now Admiral) Dewey, consisted of the *Olympia* (flagship), *Boston*, *Raleigh*, *Concord*, and *Petrel*, with two supply ships, *Nanshan* and *Zafiro*. A few days later the *Baltimore* joined us. At this time there were about 20 deaths a day in Hongkong from plague, and it behooved us to take every precaution to prevent infection from getting aboard our ships. To this end the fleet commander issued orders that no fruits nor vegetables should be brought aboard, and no water was to be drank except that distilled aboard ship, and the crews were to be aboard ship at sundown. It was a great disappointment to me not to have been able to study cases of plague, but I felt that it would be unwise to take the slightest risk of infecting the ship. As soon as we arrived I began supplying our ship with additional medical supplies, especially surgical dressings and appliances. One of the crew was sent to the hospital with typhoid fever.

On April 24 the British governor, considering that hostilities had begun with Spain, directed us to leave the harbor of Hongkong. The same day we departed for Mirs Bay, a Chinese harbor about 25 miles distant. Here we awaited the arrival of Consul Williams, of Manila, who on April 27 came aboard the *Olympia*. The fleet then left for Manila to carry out the President's order to "destroy the Spanish fleet."

On the morning of April 30 we sighted the island of Luzon, about 50 miles north of the entrance to Manila Bay. The *Concord*, *Boston*, and *Baltimore* were sent on ahead to reconnoiter in the vicinity of Subig Bay in search of the Spanish fleet. Coming up to the advance squadron in the afternoon, it was learned that nothing had been seen of the enemy's ships. About 6 o'clock in the afternoon Commodore Dewey, after consulting with his ship commanders, decided to take advantage of the darkness of night to pass the forts at the mouth of Manila Bay.

Our information as to the strength of the forts guarding the entrance to the bay, and also as to the location of the submarine mines, was extremely meager. With every light darkened except the stern light, which was screened so as to shine only to the rear, the fleet passed

Corregidor Island in single column, the *Olympia* leading the way. The *McCulloch* came among the last, just behind the *Boston*, followed by the two transports. Just as we had almost cleared the forts a battery on El Frailie opened fire on our fleet. The *Boston*, *Concord*, and *McCulloch* promptly returned the fire and the battery was soon silenced. At this trying moment came the saddest part of our ship's cruise. Chief Engineer Randall was overcome with heat while at his station in the upper engine room. The usual restorative measures were used, but without effect. He never recovered consciousness, and lived only a few hours. I had a signal sent to the flagship requesting a consulting physician, but the answer came that it was impossible under the circumstances to comply with the request.

We steamed up the bay slowly and timed our arrival off Manila at daylight. The forts at Cavite (Sangley Point) opened fire on us just as day was breaking. A signal from the flag-ship directed the *McCulloch* to guard the transports and stand ready to render aid to any ship in distress. Fortunately our assistance was not needed, but we were kept in such close proximity to the firing line that shells frequently burst above and around us. The result of this first engagement with the enemy is so well known as hardly to bear repetition. There were only eight men wounded in our fleet, all on the *Baltimore*, but not one was of a serious nature. In the second engagement, about noon, which lasted only about a half hour, the enemy offered little resistance. The number of their killed and wounded has been variously estimated; certainly it was well up in the hundreds. In company with Dr. Price, the fleet surgeon, I visited the Spanish naval hospital at Cavite a few days after the battle. We were treated courteously, both by the doctors and patients, and they evinced toward us very little feeling of bitterness. They told us they had an ample number of surgeons on duty and an abundance of surgical dressings and food supplies. They requested that guards be placed around the hospital to prevent looting by the natives.

On May 5th, after taking on an additional supply of coal, the *McCulloch* left with dispatches for Hongkong. Within forty-eight hours we reached our destination, a distance of 600 miles, the shortest time in which the passage had ever been made.

On May 13th we made a second journey to Hongkong, and this time we brought back with us to Cavite, Aguinaldo and staff. Very soon the natives were organized and making war on the Spanish troops on the outskirts of Manila. The insurgent hospital at Cavite soon became filled with wounded Spanish soldiers and a few insurgents. The natives seemed totally unprepared and incompetent to care for the wounded, so Drs. Brownell, Carpenter, Bronnick, and myself interested ourselves in the ward of the hospital. Dr. Brownell, of the *Petrel*, was especially active in rendering most efficient aid to the wounded. It was surprising to all of us how well the wounded did,

though the hospital facilities were decidedly poor. There were many cases of gunshot wounds from Mauser bullets that healed promptly without the least surgical interference. One case, I remember, was a Filipino soldier who was shot through the right lung, and returned for duty in the field at the end of three weeks. Another patient had a perforating wound of the right lobe of the liver, and was never sick enough to remain in bed. I have notes on only two cases where crushing of the bone was produced. Frequently there were clean holes through the long bones.

There was almost an entire absence of gunshot wounds of the scalp, probably due to the fact that such wounds proved instantly fatal. A number of ugly machete wounds of the face and scalp were noted, always inflicted on the Spaniards by the insurgents. The cases of gunshot wounds observed proved that the small rifle ball of high velocity is much less deadly than we were led to believe from experimental researches made prior to the war by the Medical Corps of the Army. It is certainly a humane bullet, for the fatal cases usually die on the field, and the majority of the wounded have an early and satisfactory recovery without loss of limb.

On July 15 Captain Hooper arrived on the *China* to assume command of the *McCulloch*, Captain Hodgson having been detached and ordered home on account of serious illness in his family. With Captain Hooper came 11 recruits for our ship. One of them was ill with typhoid fever, and by the end of the week three others were sick with the same disease. All were sent to the army hospital ashore and recovered. The men were probably infected from the water taken on at Honolulu. A number of soldiers were also ill aboard the *China* with typhoid fever, but fewer in proportion than among the sailors bound for the *McCulloch*.

On August 13 all the ships in the fleet weighed anchor and steamed towards Manila preparatory to an attack on the city. The army was cooperating by land. The *Olympia*, *Raleigh*, *Petrel*, and *Callao* shelled the forts and trenches and the outskirts of the city, while the army marched into Manila.

The *McCulloch* remained out with the *Baltimore*, *Charleston*, *Boston*, and *Concord*. The *Monterey* steamed within close range of the 10-inch guns guarding the city, ready to respond with her 12-inch guns. Later the surrender was made without one of the ships having been fired upon. During the month of August I had quite a number of cases of malaria aboard ship. As we were anchored one-half mile from the shore, without communication with land, and using distilled water the evidence would be in favor of the malarial poison having been transmitted by air or by the mosquitoes. It was not thought best to exclude fruits entirely, so this is a possible means of infection, though not at all probable.

Every method was adopted looking toward the preservation of the

health of the crew during the extreme heat of the tropical summer, and I always found Captain Hooper more than willing to cooperate with me in this matter. I had occasion to send some specimens of blood from fever patients to the Bureau for examination as to the widal reaction. The report from them in the main corresponded with the clinical symptoms. This would tend to show that blood specimens will bear transportation great distances through the heat of the Tropics, and yet be capable of giving the "typhoid reaction."

On September 28 I was relieved from duty on account of sickness that proved to be typhoid fever. Dr. Carpenter, of the *Olympia*, attended me during the early part of my illness, and also looked after the health of the crew. Dr. Price also came once or twice to see me in consultation. Later the *McCulloch* changed her anchorage to near the *Monadnock*, when Dr. Steel attended me. To my physicians I am indebted not only for skillful treatment, but also for many kindnesses. By the end of October I was able to return to duty. About that time smallpox broke out among the troops ashore, which fact I promptly communicated to the Marine Hospital Bureau in Washington. There were no cases in the fleet.

During the early part of November our ship was ordered to anchor for a few days at Marivelles Bay, 25 miles distant from Manila. While there I visited the Spanish quarantine station, but found little to entitle it to the name. There were no means of disinfecting baggage and only a few beds for detained passengers. The situation was a good one for a quarantine station, 25 miles from the city, at a point where vessels must pass in fairly close proximity en route to Manila. The harbor is deep and well sheltered. There is a good deal of low marshy ground near the station, and a small stream running through the village. I am not informed as to how the health of the locality would be influenced by these conditions.

Having received order to proceed to San Francisco, we left Manila on November 16, by the way of Hongkong. We remained there a few days, leaving for Amoy, China, a city that well deserves its reputation of being the dirtiest in the world. It is surprising that it is ever free from epidemic diseases; and the enormous size of the cemetery surrounding the city, would indicate that it has not altogether escaped. We continued, stopping a day at Shanghai, Nagasaki, passing through the inland sea to Kobe, and then to Yokohama. Everyone felt the sudden change from Manila (15° to 35° north longitude), though it caused no cases of serious illness. We remained at Yokohama till December 15, when we started for Honolulu which was sighted on December 28. This distance of more than 3,000 miles was made over a smooth sea, and we arrived at our destination with a good supply of coal still in the bunkers.

At Honolulu Dr. Carmichael of the Marine-Hospital Service was on duty and to him I am indebted for a pleasant visit to the island.

Here through the kindness of Dr. Alvarez, one of the recognized experts on the subject of leprosy, I visited the observation station at Klihi, about 3 miles distant from the city. Here I saw a number of cases of both the tubercular and anæsthetic form of leprosy. They are kept here for observation, or awaiting their turn to be carried to Molokai.

There were also a number of children kept here, born of leprous parents, and, contrary to what one would expect, few became infected. Nevertheless, they are removed soon after birth and kept isolated. Lack of time prevented my visiting the leprosy colony on the island of Molokai. On arrival at Honolulu I had three cases of typhoid fever aboard ship and two cases of catarrhal appendicitis. One of the patients with typhoid fever had pneumonia as a complication, which fact necessitated his being left ashore in the Queen's Hospital. The other cases continued to improve until our arrival at San Francisco, on January 9, 1899, when the cases of typhoid were transferred to the United States Marine Hospital, and those of appendicitis had sufficiently recovered to return to duty. Two days after arrival I was detached from the *McCulloch* and ordered to report to the San Francisco quarantine station for duty.

STATISTICS
OF THE
UNITED STATES MARINE-HOSPITAL SERVICE.

STATISTICS OF THE UNITED STATES MARINE- HOSPITAL SERVICE.

The following statistical tables are self-explanatory:

TABLE I.—COMPARATIVE TABLE OF NUMBER TREATED—1868 TO 1899.

The following tabular statement will serve to illustrate its growth since the reorganization of the Marine-Hospital Service in 1871:

Operations of the Marine-Hospital Service from July 1, 1868, to June 30, 1899.

Fiscal years.	Number of places at which relief was furnished.	Number of sick and disabled seamen furnished relief.
Prior to reorganization:		
1868	64	11,535
1869	64	11,356
1870	74	10,560
After reorganization:		
1871	72	14,256
1872	81	13,156
1873	91	13,529
1874	91	14,356
1875	94	15,009
1876	94	16,808
1877	100	15,175
1878	210	18,223
1879	210	20,922
1880	210	24,860
1881		32,613
1882		36,184
1883		40,195
1884		44,761
1885		41,714
1886		43,822
1887		45,314
1888		48,203
1889		49,518
1890		50,671
1891		52,992
1892		53,610
1893		53,317
1894		53,803
1895		53,643
1896		53,804
1897		54,477
1898		52,709
1899		53,489

TABLE II.—EXHIBIT OF OPERATIONS OF THE SERVICE DURING THE YEAR ENDED JUNE 30, 1899—Continued.

Ports.	Total number of seamen treated.	Patients in hospital July 1, 1898.	Admitted during the year.	Total treated in hospital.	Discharged.	Died.	Remaining in hospital June 30, 1899.	Number of days relief in hospital.	Number of persons furnished office relief.	Number of times relief was furnished.	Number of persons examined physically, including pilots.	Amount expended.	Tonnage tax collected.
New Orleans, La.	2,696	29	541	570	528	14	28	12,988	2,126	2,611	68	21,345.65	67,198.11
Newport, Ark.	56	—	15	15	15	—	—	207	41	76	76	483.96	176.85
Newport, R. I.	94	—	17	17	16	1	—	236	77	85	—	650.80	—
Newport, Vt.	—	—	—	—	—	—	—	—	—	—	—	—	—
Newport News, Va.	120	—	1,125	1,203	1,052	43	108	39,048	120	120	491	290.45	58.02
New York, N. Y.	4,626	78	477	486	449	14	23	8,080	3,423	5,082	61	62,715.86	15,424.32
Norfolk, Va.	2,105	9	12	12	12	—	—	146	1,679	2,244	—	12,378.62	277,804.32
Ogdensburg, N. Y.	81	—	—	—	—	—	—	—	—	—	—	11,443.53	11,443.53
Omaha, Neb.	—	—	—	—	—	—	—	—	—	—	—	502.89	1,496.04
Oswego, N. Y.	47	—	8	8	6	—	2	171	39	58	—	498.88	985.97
Pensacola, Fla.	133	3	101	104	96	3	5	1,604	29	98	—	2,605.94	51,378.31
Perth Amboy, N. J.	—	—	—	—	—	—	—	—	—	—	—	—	258.80
Petersburg, Va.	—	—	—	—	—	—	—	—	—	—	—	—	8.28
Philadelphia, Pa.	1,411	18	333	371	340	12	19	8,467	1,040	1,383	226	16,778.87	71,901.60
Pittsburg, Pa.	1,649	3	251	254	236	5	13	4,596	1,395	2,043	28	8,909.61	2,684.43
Plattsburgh, N. Y.	—	—	—	—	—	—	—	—	—	—	—	—	—
Plymouth, Mass.	93	—	16	16	16	—	—	238	77	107	5	455.91	12.24
Port Huron, Mich.	718	11	170	181	159	4	18	6,297	537	656	101	11,015.96	12,973.24
Portland, Me.	578	—	101	101	13	—	3	2,076	477	907	54	4,982.92	—
Portland, Ore.	39	—	13	13	13	—	—	2	34	36	—	352.10	185.40
Portsmouth, N. H.	288	11	200	211	206	4	1	2,868	210	300	7	3,686.96	—
Port Tampa, Fla.	380	25	342	370	337	15	18	14,437	231	731	—	18,017.11	16,395.06
Port Townsend, Wash.	281	—	30	50	45	3	2	821	44	65	—	2,583.99	319.23
Providence, R. I.	60	1	15	16	15	—	—	253	167	494	20	554.35	35.37
Richmond, Va.	—	—	—	—	—	—	—	—	—	—	—	—	121.32
Rochester, N. Y.	167	—	—	—	—	—	—	—	—	—	—	—	—
Rockland, Me.	—	—	—	—	—	—	—	—	—	—	—	—	—
Rome, Ga.	8	—	—	—	—	—	—	—	—	—	—	11.13	—
Sag Harbor, N. Y.	165	—	36	36	35	—	—	604	8	16	—	16.00	27.75
Saginaw, Mich.	—	—	—	—	—	—	—	—	—	—	—	—	—
St. Augustine, Fla.	—	—	—	—	—	—	—	—	—	—	—	—	—
St. Louis, Mo.	2,196	31	420	451	393	15	43	10,682	1,745	2,332	34	15,432.06	1.53
St. Marys, Ga.	—	—	—	—	—	—	—	—	—	—	—	—	—
St. Paul, Minn.	15	—	9	9	8	—	1	174	6	10	—	402.96	101.72
Salem, Mass.	14	—	—	—	—	—	—	—	—	—	—	—	—
San Diego, Cal.	108	1	16	17	17	—	—	200	14	14	—	13.00	242.94
Sandusky, Ohio	83	3	21	24	24	—	—	401	91	177	32	2,500.18	1,181.25
San Francisco, Cal.	2,711	54	739	793	677	57	59	24,219	1,918	3,565	467	594.28	37,992.60
San Pedro, Cal.	186	5	124	129	118	1	10	2,395	57	90	—	30,912.23	2,309.00
Sault Ste. Marie, Mich.	188	5	57	62	51	2	9	589	96	111	—	2,939.92	—
Savannah, Ga.	911	9	215	224	212	6	6	3,333	987	821	64	6,656.17	16,761.24

Seattle, Wash.	1,331	4	86	90	83	3	4	1,623	1,241	1,907	133	3,497.78	8,106.57
Shieldsboro, Miss.								437	268	1,365		1,087.43	188.00
Shreveport, La.	300		32	32	32			51	38	48		188.00	2,387.93
Sitka, Alaska	6		3	3	3			252	375	449		688.83	14.64
Solomons, Md.	396		21	21	21								
Stonington, Conn.													
Sturgeon Bay, Wis.	42		6	6	6			46	36	112	35	364.20	
Superior, Wis.	169	1	29	30	28	1	1	524	139	231		866.80	
Tacoma, Wash.	106		41	41	40		1	692	65	86		554.25	
Tampa, Fla.													3,813.75
Tappahannock, Va.	299		114	114	114			924	185	242		1,820.25	
Toledo, Ohio	286	5	83	88	85		3	1,310	148	414		1,356.37	23.10
Vicksburg, Miss.	69	1	68	69	65	2	2	760				1,310.50	
Vineyard Haven, Mass.	324	9	101	110	94	6	10	4,688	216	234	15	10,082.19	610.32
Waldoboro, Me.												64.29	
Washington, D. C.	139	2	29	31	28	1	2	721	108	125		23,047.08	
Washington, D. C. (laboratory)												14,506.61	
Wheeling, W. Va.	62		27	27	26	1		362	35	55		620.64	
Wilmington, Del.													
Wilmington, N. C.	322	8	105	113	98	4	11	3,656	269	272	8	8,109.72	7,668.00
Wiscasset, Me.													3,353.55
Cape Charles Quarantine.	5												188.04
Cape Fear Quarantine.	5		5	5	5			6	5	6	13	(1)	
Delaware Breakwater Quarantine.	10		10	10	10			97			7		
Gulf Quarantine.	68	2	41	43	41	1	1	350	25	31			
San Francisco Quarantine.	54		6	6	6			153	48	145			
South Atlantic Quarantine.	9		9	9	9			117					
Tortugas Quarantine.	74		14	14	14			185	60	77			

¹ Expenditures for quarantine stations appear elsewhere in financial statement.

TABLE III.—SUMMARY OF PHYSICAL EXAMINATIONS OF SEAMEN MADE BY OFFICERS OF THE UNITED STATES MARINE-HOSPITAL SERVICE, YEAR ENDED JUNE 30, 1899.

Summary of examinations and causes of rejection.	Total.	Pilots.	Revenue-Cutter Service.	Life-Saving Service.	Coast-Survey Service.	Marine-Hospital Service.	Light-House Service.	Naval Reserve.
Summary of examinations:								
Total number examined.....	4, 184	1, 860	990	1, 271	36	5	14	8
Number passed.....	3, 934	1, 796	885	1, 197	30	.....	13	8
Number rejected.....	250	64	105	74	6	.....	1	.....
Causes of rejection:								
Chorea.....	3	2	1	.....	.....	.....	.....	.....
Color-blindness.....	35	25	5	4	.....	.....	1	.....
Consolidation of lung.....	3	.....	1	2	.....	.....	.....	.....
Curvature of spine.....	2	.....	1	1	.....	.....	.....	.....
Deafness.....	7	3	2	2	.....	.....	.....	.....
Debility.....	2	.....	1	1	.....	.....	.....	.....
Defective vision.....	10	3	4	3	.....	.....	.....	.....
Diarrhea.....	4	.....	2	.....	2	.....	.....	.....
Disease of heart—								
Fatty degeneration.....	3	2	.....	1	.....	.....	.....	.....
Hypertrophy.....	5	1	2	2	.....	.....	.....	.....
Mitral insufficiency.....	7	.....	3	3	1	.....	.....	.....
Mitral regurgitation.....	4	1	2	1	.....	.....	.....	.....
Valvular, aortic.....	4	1	2	1	.....	.....	.....	.....
Enlargement of tonsils.....	6	2	2	2	.....	.....	.....	.....
Epididymitis.....	10	3	2	4	1	.....	.....	.....
Fistula in ano.....	2	.....	2	.....	.....	.....	.....	.....
Gonorrhea.....	9	.....	3	5	1	.....	.....	.....
Hemorrhoids—								
External.....	7	1	5	1	.....	.....	.....	.....
Internal.....	9	3	3	3	.....	.....	.....	.....
Hernia—								
Inguinal.....	3	.....	1	2	.....	.....	.....	.....
Oblique.....	3	.....	3	.....	.....	.....	.....	.....
Hydrocele.....	6	2	3	1	.....	.....	.....	.....
Insufficient stature.....	1	.....	.....	1	.....	.....	.....	.....
Insufficient chest expansion.....	2	.....	1	.....	.....	.....	.....	.....
Myopia.....	7	3	3	1	.....	.....	.....	.....
Neurasthenia.....	1	.....	1	.....	.....	.....	.....	.....
Nephritis.....	5	.....	4	1	.....	.....	.....	.....
Opacity of cornea.....	4	.....	2	2	.....	.....	.....	.....
Phthisis, chronic.....	3	2	.....	1	.....	.....	.....	.....
Pleurisy, chronic.....	2	.....	1	1	.....	.....	.....	.....
Presbyopia.....	1	.....	.....	1	.....	.....	.....	.....
Rheumatism.....	10	.....	5	5	.....	.....	.....	.....
Sarcoma of testicles.....	4	.....	2	.....	.....	.....	.....	.....
Sprain of ankle.....	2	.....	.....	1	1	.....	.....	.....
Syphilis—								
Primary.....	9	1	8	.....	.....	.....	.....	.....
Secondary.....	10	4	6	.....	.....	.....	.....	.....
Tubercle of lungs.....	15	5	5	5	1	.....	.....	.....
Tumor of leg.....	3	.....	2	2	.....	.....	.....	.....
Ulcer of penis.....	4	.....	2	2	.....	.....	.....	.....
Ulcer of leg.....	1	.....	1	.....	.....	.....	.....	.....
Varicose veins of leg.....	13	.....	6	7	.....	.....	.....	.....
Varicocele.....	6	.....	5	1	.....	.....	.....	.....
Weak pulse.....	3	.....	1	2	.....	.....	.....	.....

TABLE IV.—STATEMENT, BY DISTRICTS, OF THE NUMBER OF PATIENTS TREATED DURING THE YEAR ENDED JUNE 30, 1899.

Districts.	Total cases.	Patients in hospital July 1, 1898.	Admitted during the year.	Total number treated in hospital.	Discharged.	Died.	Patients in hospital June 30, 1899.	Number of days hospital relief furnished.	Number of seamen furnished office relief.
Grand total.....	55, 489	710	11, 900	12, 610	11, 418	430	762	317, 570	42, 879
North Atlantic.....	5, 860	78	1, 246	1, 324	1, 195	45	84	40, 634	4, 536
Middle Atlantic.....	6, 333	99	1, 579	1, 678	1, 486	62	130	49, 289	4, 655
South Atlantic.....	9, 227	103	1, 833	1, 936	1, 758	58	120	49, 819	7, 291
The Gulf.....	6, 701	109	1, 615	1, 724	1, 602	48	74	36, 914	4, 977
The Ohio.....	4, 065	42	963	1, 005	910	33	62	23, 144	3, 060
The Mississippi.....	4, 500	59	1, 187	1, 246	1, 136	39	71	21, 887	3, 254
The Great Lakes.....	12, 708	124	1, 866	1, 990	1, 806	65	119	47, 804	10, 718
The Pacific.....	5, 870	94	1, 526	1, 620	1, 441	79	100	47, 176	4, 250
The quarantine stations.....	225	2	85	87	84	1	2	908	138

TABLE V.—RATIO OF PATIENTS TREATED IN HOSPITAL IN EACH DISTRICT.

Districts.	Per cent of total number of patients.	Districts.	Per cent of total number of patients.
North Atlantic	22.59	The Mississippi	27.68
Middle Atlantic	26.49	The Great Lakes	15.65
South Atlantic	20.98	The Pacific	27.59
The Gulf	25.72	The quarantine stations	38.66
The Ohio	24.72		

TABLE VI.—AVERAGE DURATION OF TREATMENT IN HOSPITAL IN EACH DISTRICT.

Districts.	Average number of days' relief furnished to each patient.	Districts.	Average number of days' relief furnished to each patient.
North Atlantic	36.90	The Mississippi	17.56
Middle Atlantic	39.37	The Great Lakes	24.02
South Atlantic	25.73	The Pacific	29.12
The Gulf	21.41	The quarantine stations	10.43
The Ohio	33.02		

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899.

Diseases.	Number of cases.								
	Remaining under treatment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treatment at close of year.	Number furnished office relief.	Number treated in hospital and dispensary.
			Recovered.	Improved.	Not improved.				
Total of all cases	710	11,900	7,394	3,716	308	430	762	12,879	55,489
GENERAL DISEASES	317	5,493	3,347	1,780	128	239	316	20,135	25,945
LOCAL DISEASES	395	4,384	2,591	1,431	151	168	338	18,989	33,668
GENERAL INJURIES	15	132	97	43	—	1	6	153	300
LOCAL INJURIES	83	1,891	1,359	462	29	22	102	3,602	5,576

NORTH ATLANTIC.

TOTAL CASES	78	1,246	779	392	24	45	84	4,536	5,860
General Diseases	33	547	334	181	8	30	27	1,960	2,540
Smallpox	—	2	1	—	—	—	1	2	4
Cowpox	—	—	—	—	—	—	—	6	6
Measles	—	5	4	—	—	—	1	4	9
Scarlet fever	—	1	1	—	—	—	—	—	1
Influenza	—	45	40	4	1	—	—	270	315
Mumps	—	4	3	—	—	—	1	4	8
Simple continued fever	—	2	2	—	—	—	—	1	3
Enteric fever	—	31	20	8	—	3	—	9	40
Dysentery	—	11	6	2	1	—	2	4	15
Malarial fever:									
Intermittent	—	106	97	8	1	1	—	79	18
Remittent	—	32	33	1	—	—	—	14	48
Erysipelas	—	2	2	—	—	—	—	3	5
Phlegmonous	—	1	1	—	—	—	—	—	1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

NORTH ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.	Died.			
General Diseases—Continued.									
Tubercle.....	11	38	—	27	2	15	5	29	78
Syphilis:									
Primary.....	—	7	3	4	—	—	—	48	55
Secondary.....	7	66	60	1	4	2	318	391	
Gonorrhea.....	3	52	41	11	—	—	634	689	
Diseases dependent on animal parasites:									
Bothriocephalus latus.....	—	—	—	—	—	—	—	1	1
Tænia solium.....	—	3	3	—	—	—	—	3	3
Phthirus inguinalis.....	—	—	—	—	—	—	—	3	3
Culex anxifer.....	—	—	—	—	—	—	—	1	1
Sarcoptes scabiei.....	—	—	—	—	—	—	—	2	2
Diseases dependent on vegetable para- sites—Trichophyton tonsurans.....	—	—	—	—	—	—	—	10	10
Effects of vegetable poisons:									
Tobacco.....	—	—	—	—	—	—	—	10	10
Rhus toxicodendron.....	—	—	—	—	—	—	—	1	1
Effects of inorganic poisons.....	—	1	—	—	—	1	—	—	1
Lead.....	—	1	—	—	—	—	1	—	1
Mercury.....	—	—	—	—	—	—	—	2	2
Effects of the presence of foreign bodies.....	—	—	—	—	—	—	—	1	1
Effects of heat.....	—	1	—	1	—	—	—	—	1
Effects of cold.....	1	—	1	—	—	—	—	—	1
Scurvy.....	—	1	1	—	—	—	—	—	1
Alcoholism.....	—	10	8	1	—	1	21	31	
Rheumatic fever.....	2	21	13	6	—	2	7	30	
Rheumatism.....	4	73	33	41	—	1	318	395	
Cyst:									
Acinous.....	—	1	1	—	—	—	—	—	1
Sebaceous.....	—	5	4	1	—	—	—	7	12
New growth, nonmalignant:									
Lipoma.....	—	2	2	—	—	—	3	5	
Fibroma.....	—	1	—	—	—	—	1	2	
Papilloma.....	—	2	1	1	—	—	6	8	
New growth, malignant:									
Sarcoma.....	—	1	—	1	—	—	—	1	1
Carcinoma.....	2	1	—	1	—	2	1	4	
Squamous carcinoma.....	—	2	2	—	—	—	—	2	2
Anæmia.....	—	—	—	—	—	—	—	11	11
Diabetes mellitus.....	—	1	—	1	—	—	—	10	11
Diabetes insipidus.....	—	1	—	—	—	—	—	—	1
Debility.....	13	11	1	—	1	—	118	131	
Old age.....	—	1	—	—	1	—	—	—	1
Local Diseases.....	33	494	293	160	16	15	43	2,133	2,660
DISEASES OF THE NERVOUS SYSTEM.....	10	30	8	11	6	2	13	65	105
Of the nerves:									
Inflammation—									
Neuritis.....	—	4	3	1	—	—	—	2	6
Multiple neuritis.....	—	2	1	1	—	—	—	1	3
Of the spinal cord and membranes—									
Cord:									
Inflammation—Local.....	—	1	—	1	—	—	—	—	1
Degeneration—									
Of lateral columns.....	2	—	—	—	—	—	—	—	2
Of posterior columns.....	1	2	—	1	—	—	2	—	5
Of the brain and its membranes—									
Membranes:									
Hæmorrhage.....	1	—	—	—	—	—	1	—	1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

NORTH ATLANTIC—Continued.

Diseases.	Number of cases.							
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.
			Recovered.	Improved.	Not improved.	Died.		
Local Diseases—Continued.								
DISEASES OF THE NERVOUS SYSTEM—Continued.								
Functional nervous disorders, with other diseases of undetermined nature:								
Paralysis—								
Paraplegia	1		1					1
Hemiplegia	2	2					4	4
Monoplegia		2			1		1	2
Local paralysis.								2
Incomplete paralysis.	1			1				1
Paralysis agitans.								1
Epilepsy		4		2	1		1	3
Vertigo								2
Headache								6
Neuralgia		5	3	2				34
Nervous weakness.								7
Mental diseases:								
Mania	2	1			2		1	3
Melancholia		3		1	1	1		3
Dementia		3			1	1	1	3
Mental stupor								2
Delusional insanity		1		1				1
DISEASES OF THE EYE	1	10	6	3			2	56
Conjunctivitis—								
Acute		2	1				1	33
Purulent		1	1					1
Keratitis								1
Ulceration of cornea								1
Scleritis								1
Iritis		5	3	2				5
Congestion of the disk								1
Atrophy and degeneration of optic nerve or papilla	1						1	
Lenticular cataract								1
Shrunken eyeball		1		1				1
Amblyopia—Functional night blindness.								2
Ametropia								1
Disorders of accommodation—Presbyopia								2
Abscess of lachrymal sac		1	1					2
Epiphora								1
Blepharitis marginalis								3
Sty								3
DISEASES OF THE EAR		9	7	2				40
Inflammation of the external meatus—								
Acute								1
Chronic								1
Caries of the auricle								1
Accumulation in external meatus of wax or epidermis								9
Inflammation of the middle ear—								
Nonsuppurative		2	1	1				13
Suppurative		7	6	1				8
Within the mastoid cells								1
Ulceration of membrana tympani								2
Tinnitus								3
Deafness								1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

NORTH ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE NOSE.....		3	2				1	38	41
Inflammation of soft parts.....		3						37	39
Inflammation of framework.....		1					1	1	2
Diseases of septum.....								3	3
Deviations.....								1	1
Inflammation of the naso-pharynx.....								2	2
DISEASES OF THE CIRCULATORY SYS- TEM.....	5	34	5	23		6	5	51	90
Pericarditis.....		1		1				1	2
Endocarditis.....		1				1		1	2
Valvular disease.....	5	20		18		4	3	23	48
Degeneration of heart—fatty.....								2	2
Dilatation of heart.....								1	1
Angina pectoris.....		1		1					1
Disordered action of the heart— Abnormal rapidity.....								1	1
Irregularity.....								1	1
Arteritis—endarteritis.....		2		1		1			2
Aneurism of arteries.....								1	1
Phlebitis.....		2	1				1		2
Varix.....		4	2				1	21	28
DISEASES OF THE RESPIRATORY SYS- TEM.....	4	60	39	23		1	1	423	487
Inflammation of mucous membrane of larynx—catarrhal, acute.....		1		1				8	9
Bronchitis— Catarrhal, acute.....	1	27	17	11				256	284
Catarrhal, chronic.....	1	6	1	6				106	113
Spasmodic asthma.....								9	9
Hæmorrhage of lung—Hæmoptysis.....								3	3
Pneumonia.....		13	10	2		1		3	16
Phthisis— Chronic.....								12	12
Tubercular.....	1						1	6	7
Empysema.....		1	1						1
Pleurisy— Acute.....	1	11	9	3				13	25
Chronic.....		1	1					7	8
DISEASES OF THE DIGESTIVE SYSTEM.....	7	124	91	28	6	3	3	642	773
Inflammation of the lips.....								2	2
Ulceration of the lips.....								1	1
Fissure of the lips.....								1	1
Inflammation of the mouth.....								2	2
Ulceration of the mouth.....								3	3
Inflammation of the dental pulp.....		1		1					1
Necrosis of cementum.....								19	19
Abscess of dental periosteum.....		1	1						1
Inflammation of gums and alveoli.....								5	5
Suppuration of alveoli.....								1	1
Ulceration of gums and alveoli.....								4	4
Caries of the alveoli.....								1	1
Necrosis of the alveoli.....								1	1
Toothache.....								4	4
Ulceration of the tongue.....		1		1				2	3
Sore throat.....								16	16
Ulceration of the tonsils.....		1	1					2	3
Inflammation of the tonsils— Follicular.....		11	10	1				52	63
Suppuration.....		17	15	2				10	27

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES
TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

NORTH ATLANTIC—Continued.

[illegible]

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

NORTH ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Injuries—Continued.									
LOCAL INJURIES:									
Sprain of elbow	1	1		2				1	3
Sprain of wrist		5	4	1				18	23
Sprain of hand								3	3
Sprain of thumb								1	1
Wound of upper extremities	1	16	17					92	109
Fracture of clavicle		5	5					3	8
Fracture of humerus								1	1
Fracture of bones of forearm—									
Radius								2	2
Ulna		2	2					1	3
Both bones		3	2				1	2	5
Fracture of carpus, metacarpus, or phalanges		2		1			1	5	7
Dislocation of clavicle		1	1						1
Dislocation of humerus	2	5	5	2				3	10
Dislocation of radius and ulna			5					2	2
Dislocation of the metacarpus		1					1		1
Dislocation of phalanges of thumb								3	3
Dislocation of phalanges of fingers								2	2
Green-stick fracture of the ulna		1	1						1
Contusion of lower extremities	1	21	14	6			2	33	55
Sprain of knee		6	5	1				8	14
Sprain of ankle	1	14	9	6				21	36
Wound of lower extremities		6	5				1	11	17
Fracture of femur	1	6	2	2			3	1	8
Fracture of tibia		3		2			1		3
Fracture of fibula	1	3	4					3	7
Fracture of tibia and fibula		6	4				2	1	7
Fracture of bones of foot—									
Of the metatarsus	1	1	1	1					2
Of the phalanges of the toes		4	2	2				2	6
Dislocation of femur		2	1	1					2
Dislocation of foot		1		1				1	2
Dislocation of metatarsus and pha- langes		1	1						1

MIDDLE ATLANTIC.

TOTAL CASES	99	1,579	926	500	60	62	130	4,655	6,333
General Diseases	45	669	363	215	32	35	69	1,808	2,522
Smallpox		1	1						1
Cowpox								149	149
Chicken pox								1	1
Measles								1	1
Scarlet fever		2	1		1				2
Influenza		39	32	6	1			46	85
Whooping cough								1	1
Mumps		6	4	1	1			1	7
Simple continued fever								3	3
Enteric fever	2	33	26	5		4		3	38
Dysentery	2	10	11	1				21	33
Beriberi		5		5				11	16
Malarial fever:									
Intermittent	1	139	116	7		1	7	176	307
Remittent		41	37	3		1		8	49
Erysipelas		5	3	1		1		3	8

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

MIDDLE ATLANTIC—Continued.

Diseases.	Number of cases.									
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.	
			Recovered.	Improved.	Not improved.	Died.				
Local Diseases—Continued.										
DISEASES OF THE NERVOUS SYSTEM—Continued.										
Functional nervous disorders with other diseases of undetermined nature—Continued.										
Paralysis agitans.....		1		1				2		3
Chorea.....		1		1						1
Spasm.....		1		1						1
Epilepsy.....		1		1				3		4
Vertigo.....		1	1					3		4
Headache.....								13		13
Hyperæsthesia.....								1		1
Facial hemiatrophy.....								1		1
Neuralgia.....	1	13	6	7	1			65		79
Aphasia.....		1		1						1
Hiccough.....								1		1
Nervous weakness.....	1	1		1	1			13		15
Mental diseases—										
Mania.....		1	1							1
Melancholia.....		1		1				2		3
DISEASES OF THE EYE.....	2	11	6	4	3			38		51
Conjunctivitis—Acute.....		6	3	2	1			27		33
Keratitis.....	1	1	1							2
Ulceration of cornea.....		1			1			1		2
Iritis.....		1	1					5		6
Detachment of the retina.....		1	1							1
Lenticular cataract.....	1			1						1
Ametropia.....								1		1
Myopia.....		1		1						1
Astigmatism.....										1
Disorders of accommodation—										
Presbyopia.....								1		1
Squint.....								1		1
Blepharitis marginalis.....								1		1
DISEASES OF THE EAR.....	1	11	6	3			3	27		39
Inflammation of the external meatus—										
Acute.....								2		2
Abscess.....		2	2							2
Accumulation in external meatus of wax or epidermis.....								5		5
Inflammation of the middle ear—										
Non-suppurative.....		1	1					3		4
Suppurative.....	1	8	3	3			3	14		23
Perforation of membrana tympani.....								1		1
Deafness.....								2		2
DISEASES OF THE NOSE.....								60		60
Inflammation of soft parts.....								60		60
Diseases of septum.....								1		1
Epistaxis.....								1		1
DISEASES OF THE CIRCULATORY SYSTEM.....	5	28	1	21	2	5	4	54		87
Endocarditis.....		2		1				2		4
Valvular disease.....	4	18		14	1	3	4	29		51
Hypertrophy of heart.....								1		1
Angina pectoris.....		1		1				1		1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

MIDDLE ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Inflammation of the intestines—									
Enteritis		1	—	1	—	—	—	2	3
Typhlitis		4	2	—	—	—	—	2	5
Catarrhal		2	1	1	—	—	—	1	10
Hernia		13	5	7	—	—	1	167	180
Fissure of the anus		2	2	—	—	—	—	—	2
Constipation		4	3	1	—	—	—	64	68
Colic		2	2	—	—	—	—	5	7
Diarrhea	1	25	12	4	—	—	—	83	109
Periproctitis—Abscess	1	5	2	2	—	—	—	—	6
Ulceration of the rectum	1	1	—	1	—	—	—	3	4
Stricture of the intestines	—	2	—	1	—	—	1	—	2
Fistula in ano	1	2	3	—	—	—	—	2	5
Prolapse of the rectum	1	1	1	1	—	—	—	—	4
Piles—									
Internal	1	9	7	1	—	—	2	2	12
External	—	3	3	—	—	—	—	25	28
Pruritus ani	—	—	—	—	—	—	—	1	1
Inflammation of the liver—									
Acute abscess	—	1	—	—	—	1	—	—	1
Chronic	1	—	—	1	—	—	—	—	1
Hypertrophy of the liver	—	—	—	—	—	—	—	5	5
Jaundice	—	7	5	2	—	—	—	—	7
Calculi	—	1	—	1	—	—	—	1	2
DISEASES OF THE LYMPHATIC SYSTEM.									
Inflammation of lymph glands	5	66	47	14	3	2	5	98	169
Suppuration	4	49	36	12	2	2	1	94	147
Inflammation of lymphatics	1	16	11	1	1	—	4	2	19
DISEASES OF THE URINARY SYSTEM.									
Acute nephritis	3	32	2	19	2	8	4	34	69
Bright's disease	—	3	—	2	1	—	—	—	3
Pyelitis	3	20	—	12	1	6	4	10	33
Nephralgia	—	1	—	—	—	—	—	—	1
Suppression of urine	—	1	—	—	—	1	—	1	2
Hæmaturia	—	—	—	—	—	—	—	—	2
Lithuria	—	—	—	—	—	—	—	2	2
Inflammation of bladder—									
Acute	—	3	1	2	—	—	—	15	18
Chronic	—	1	—	1	—	—	—	1	2
Irritability of bladder	—	—	—	—	—	—	—	1	1
Retention of urine	—	1	1	—	—	—	—	2	3
Incontinence of urine	—	1	—	1	—	—	—	—	1
DISEASES OF THE GENERATIVE SYSTEM.									
Urethritis	3	89	45	33	3	1	10	342	434
Gleet	—	1	1	—	—	—	—	7	8
Ulcer of the urethra	—	2	1	1	—	—	—	32	34
Stricture of urethra—								2	2
Organic	1	21	8	13	—	—	1	35	57
Traumatic	—	1	—	—	—	—	1	—	1
Urethral fistula	—	2	—	1	—	—	1	—	2
Extravasation of urine	—	1	—	—	—	1	—	—	1
Inflammation of prostate—									
Chronic	—	—	—	—	—	—	—	2	2
Hypertrophy of the prostate	—	1	—	1	—	—	—	3	4
Oedema of the prepuce	—	—	—	—	—	—	—	2	2
Hypertrophy of the prepuce	—	—	—	—	—	—	—	1	1
Phimosis	—	5	2	2	1	—	—	4	9

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

MIDDLE ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.	Died.			
Injuries	11	307	228	73	5	1	11	533	851
GENERAL INJURIES	1	23	17	6			1	7	31
Effects of heat—									
Burns and scalds.....	1	15	12	3			1	1	17
Heat stroke.....								2	2
Sunstroke.....		2	2						2
Effects of cold.....								4	4
Multiple injury.....		12	1	1					2
Starvation.....		1	1	1					2
Exhaustion.....		12	1	1					2
LOCAL INJURIES	10	284	211	67	5	1	10	523	820
Compression of nerves.....								1	1
Strain of muscles.....		1		1				4	5
Rupture of tendons.....		1		1					1
Contusion of skin.....								11	11
Abrasion of skin.....								3	3
Wound of skin.....		2	1	1					2
Burn or scald of skin.....								20	20
Frostbite.....		18	14	3			1	18	36
Effects on the skin of irritants or corrosives.....								1	1
Wound of scalp.....	1	18	15	4				27	46
Concussion of brain.....		2	1	1				1	3
Compression of brain.....		1		1					1
Contusion of face.....		3	2				1	6	9
Foreign bodies in the nose, antrum, or other cavities.....	1	13	12	2				15	29
Fracture of facial bones.....		1		1					1
Lower jaw.....	1			1					1
Contusion of eyelid.....		1						1	1
Wound of eyelid.....		1		1				2	3
Contusion of eyeball.....		1	1						1
Foreign bodies in the eyeball.....								1	1
Contusion of pinna.....								2	2
Contusion of neck.....								1	1
Wound of neck.....		3	2	1					3
Foreign body in the food passages.....								1	1
Contusion of chest.....		5	4	1				14	19
Fracture of ribs.....	1	8	7	2				19	19
Gunshot wound of chest.....		6	4	2					6
Contusion of back.....		7	6		1			11	18
Sprain of back.....		1	1					18	19
Wound of back.....		3	3					1	4
Contusion of abdomen.....		2	1				1		2
Wound of parietes of abdomen.....		2	1	1					2
Contusion of the pelvis.....								1	1
Wound of the male urethra, peri- næum, scrotum, testis, or penis.....		5	3	1			1	2	7
Contusion of upper extremities.....	1	17	11	5			2	30	48
Sprain of shoulder.....		1	1					7	8
Sprain of elbow.....		2	1	1				3	5
Sprain of wrist.....		2	1	1				18	20
Sprain of hand.....								2	2
Sprain of thumb.....	1	1	1	1				3	5
Wound of upper extremities.....	1	65	48	17			1	164	230
Fracture of clavicle.....		3	3					1	4
Fracture of bones of forearm—									
Radius.....		1	1					4	5
Ulna.....								1	1
Both bones.....		2	2					7	9
Fracture of carpus, metacarpus, or phalanges.....		3	2		1				3

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

MIDDLE ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.	Died.			
Injuries—Continued.									
LOCAL INJURIES—Continued.									
Dislocation of humerus.....		3	2		1				3
Dislocation of phalanges of fingers.....								1	1
Contusion of lower extremities.....	1	15	13	3				39	55
Sprain of knee.....		2	1	1				7	9
Sprain of ankle.....		6	5	1				18	24
Wound of lower extremities.....								45	45
Wound of joint, lower extremities.....		43	31	9	1	1	1		43
Injury to bursa.....		1	1					1	2
Fracture of femur.....	1	1	1		1		1	1	4
Fracture of patella.....		1	1					1	1
Fracture of tibia.....	1		1						1
Fracture of fibula.....		1	1						1
Fracture of tibia and fibula.....		1	5	2				2	9
Dislocation of femur.....		2		1			1		2

SOUTH ATLANTIC.

TOTAL CASES.....	103	1,833	1,111	600	47	58	120	7,291	9,227
General Diseases.....	33	967	609	302	14	37	38	3,682	4,682
Smallpox.....		19	19					3	22
Cowpox.....		2		2				293	295
Chicken pox.....								2	2
Measles.....		8	8					1	9
Influenza.....		106	66	35	3	2		376	482
Mumps.....		13	11	2				11	24
Cerebrospinal fever.....		1				1			1
Simple continued fever.....								1	1
Enteric fever.....	6	43	33	6	1	7	2	3	52
Choleraic diarrhœa.....		1	1					3	4
Epidemic diarrhœa.....		1		1				3	4
Dysentery.....	1	33	23	8		1	2	55	89
Malarial fever:									
Intermittent.....	2	256	230	19	1	2	6	961	1,219
Remittent.....	4	111	80	25	1	5	4	95	210
Phagedæna.....		1					1		1
Erysipelas.....	1	8	8	1				5	14
Pyæmia.....		1		1					1
Tubercle.....	9	38	2	23	3	14	5	53	100
Syphilis:									
Primary.....		6	2	3			1	45	51
Secondary.....	2	93		85	1		9	458	553
Gonorrhœa.....		62	38	20			4	674	736
Diseases dependent on animal parasites:									
Tænia solium.....								1	1
Phthirus inguinalis.....								1	1
Sarcoptes scabiei.....								12	12
Diseases dependent on vegetable para- sites:									
Trichophyton tonsurans.....								9	9
Microsporion furfur.....								1	1
Effects of animal poisons—Decayed and poisonous food.....		1	1						1
Effects of vegetable poisons.....		1		1				1	2
Opium.....		1				1			1
Effects of inorganic poisons—Lead.....		1	1					2	3
Effects of the presence of foreign bodies.....		2		2					2

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

SOUTH ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
General Diseases—Continued.									
Effects of heat	—	4	4	—	—	—	—	—	4
Effects of cold	—	—	—	—	—	—	—	1	1
Scurvy	—	1	1	—	—	—	—	1	2
Alcoholism	—	8	7	1	—	—	—	5	13
Rheumatic fever	2	30	15	16	—	1	—	36	68
Rheumatism	5	98	56	42	1	1	3	459	562
Gout	—	—	—	—	—	—	—	4	4
Osteoarthritis	—	—	—	—	—	—	—	4	4
New growth, nonmalignant:	—	—	—	—	—	—	—	—	—
Lipoma	—	—	—	—	—	—	—	13	13
Fibroma	—	2	1	1	—	—	—	1	3
Osteoma	—	1	—	1	—	—	—	—	1
Papilloma	—	—	—	—	—	—	—	2	2
Adenoma	—	1	1	—	—	—	—	3	4
Pterygium	—	1	—	—	1	—	—	—	1
New growth, malignant:	—	—	—	—	—	—	—	—	—
Sarcoma	—	—	—	—	—	—	—	1	1
Carcinoma	—	2	—	—	1	1	—	1	3
Anæmia	—	1	—	1	—	—	—	3	4
Purpura	—	1	1	—	—	—	—	—	1
Leucocythæmia	—	—	—	—	—	—	—	2	2
Diabetes mellitus	—	3	—	2	—	—	1	5	8
Diabetes insipidus	—	—	—	—	—	—	—	1	1
Debility	1	5	—	4	1	1	—	65	71
Local Diseases	61	632	348	227	28	18	72	3,142	3,835
DISEASES OF THE NERVOUS SYSTEM	32	38	21	10	—	3	36	136	206
Of the nerves:	—	—	—	—	—	—	—	—	—
Inflammation—	—	—	—	—	—	—	—	—	—
Neuritis	1	1	—	1	—	1	—	3	5
Multiple neuritis	—	1	—	1	—	—	—	—	1
Of the spinal cord and membranes—	—	—	—	—	—	—	—	—	—
Cord:	—	—	—	—	—	—	—	—	—
Inflammation	—	1	1	—	—	—	—	1	2
Of the brain and its membranes—	—	—	—	—	—	—	—	—	—
Brain:	—	—	—	—	—	—	—	—	—
Sclerosis	—	—	—	—	—	—	—	1	1
Hyperæmia	—	1	1	—	—	—	—	—	1
Functional nervous disorders with	—	—	—	—	—	—	—	—	—
other diseases of undetermined na-	—	—	—	—	—	—	—	—	—
ture:	—	—	—	—	—	—	—	—	—
Paralysis—	—	—	—	—	—	—	—	—	—
Paraplegia	2	—	—	—	—	—	2	—	2
Hemiplegia	3	5	1	2	—	—	5	3	11
Local paralysis	—	1	—	1	—	—	—	—	1
Spasm	—	—	—	—	—	—	—	3	3
Torticollis	—	—	—	—	—	—	—	1	1
Epilepsy	—	2	—	2	—	—	—	3	5
Vertigo	—	1	1	—	—	—	—	5	6
Headache	—	1	1	—	—	—	—	14	15
Neuralgia	—	16	13	3	—	—	—	90	106
Nervous weakness	—	1	—	—	—	—	1	7	8
Mental diseases:	—	—	—	—	—	—	—	—	—
Mania	11	2	2	—	—	1	10	1	14
Melancholia	11	—	—	—	—	—	11	4	15
Dementia	3	4	1	—	—	1	5	—	7
General paralysis of the insane	1	1	—	—	—	—	2	—	2

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

SOUTH ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE EYE	2	14	8	6	1	—	1	59	75
Conjunctivitis—									
Acute	—	6	6	—	—	—	—	35	41
Chronic	—	—	—	—	—	—	—	1	1
Keratitis	1	1	—	—	—	—	—	5	7
Ulceration of cornea	—	4	2	2	—	—	—	2	6
Opacity of cornea	—	2	—	2	—	—	—	—	2
Iritis	—	—	—	—	—	—	—	2	2
Hypopyon	—	1	—	—	1	—	—	1	2
Lenticular cataract	1	—	—	—	—	—	1	—	1
Amblyopia—Functional night blind- ness	—	—	—	—	—	—	—	1	1
Sty	—	—	—	—	—	—	—	10	10
Abscess of eyelid	—	—	—	—	—	—	—	1	1
Oedema of eyelid	—	—	—	—	—	—	—	1	1
DISEASES OF THE EAR	1	8	4	1	3	—	1	38	47
Inflammation of the external meatus—									
Acute	—	1	—	—	—	—	1	10	11
Chronic	—	—	—	—	—	—	—	2	2
Abscess	—	1	1	—	—	—	—	5	6
Accumulation in external meatus of wax or epidermis	—	—	—	—	—	—	—	4	4
Inflammation of the middle ear—									
Suppurative	1	—	—	—	1	—	—	10	11
Within the mastoid cells	—	5	3	1	1	—	—	5	10
Ulceration of membrana tym- pani	—	1	—	—	1	—	—	1	2
Tumors	—	—	—	—	—	—	—	1	1
DISEASES OF THE NOSE	—	—	—	—	—	—	—	45	45
Inflammation of soft parts	—	—	—	—	—	—	—	45	45
Diseases of septum	2	—	—	2	—	—	—	9	11
Abscess	1	—	—	1	—	—	—	—	1
Deviations	—	—	—	—	—	—	—	2	2
Inflammation of the naso-pharynx	—	1	—	1	—	—	—	7	8
DISEASES OF THE CIRCULATORY SYSTEM	4	30	3	20	5	1	5	34	68
Pericarditis	—	1	1	—	—	—	—	—	1
Endocarditis	—	1	—	1	—	—	—	1	2
Valvular disease	4	16	—	14	2	1	3	15	35
Hypertrophy of heart	—	—	—	—	—	—	—	2	2
Dilatation of heart	—	—	—	—	—	—	—	1	1
Angina pectoris	—	—	—	—	—	—	—	2	2
Disordered action of the heart	—	—	—	—	—	—	—	1	1
Abnormal rapidity	—	—	—	—	—	—	—	2	2
Irregularity	—	2	—	2	—	—	—	3	5
Aneurysm of arteries	4	—	—	—	2	—	2	2	6
Obstruction of arteries—Embolism	—	1	—	—	1	—	—	—	1
Phlebitis	—	—	—	—	—	—	—	—	1
Obstruction of veins	—	1	1	—	—	—	—	—	1
Varix	—	4	1	3	—	—	—	4	8
DISEASES OF THE RESPIRATORY Sys- TEM	1	110	55	47	4	4	1	570	681
Hay fever	—	—	—	—	—	—	—	1	1
Inflammation of mucous membrane of larynx—									
Catarrhal, acute	—	—	—	—	—	—	—	4	4
Catarrhal, chronic	—	—	—	—	—	—	—	1	1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

SOUTH ATLANTIC—Continued.

Diseases.	Number of cases.								
	Remaining under treatment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treatment at close of year.	Number furnished office relief.	Number treated in hospital and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE RESPIRATORY SYSTEM—Continued.									
Bronchitis—									
Catarrhal, acute		44	29	12	1	2		447	491
Catarrhal, chronic		12	3	8	1			88	100
Spasmodic asthma		5	1	4				9	14
Hæmorrhage of lung—Hæmoptysis.		2	2						2
Pneumonia	1	23	12	8	1	2			23
Broncho-pneumonia		1	1						1
Phthisis—									
Chronic		2		1	1			3	5
Tubercular		5		5					5
Emphysema		1		1					1
Pleurisy—									
Acute		15	7	8				11	26
Chronic		1					1	6	7
DISEASES OF THE DIGESTIVE SYSTEM.									
	3	116	81	23	6	4	5	1,085	1,204
Fissure of the lips								1	1
Inflammation of the mouth								5	5
Ulceration of the mouth								5	5
Caries of dentine and cementum								25	25
Absorption of cementum								1	1
Abscess of dental periosteum								7	7
Inflammation of gums and alveoli								2	2
Ulceration of gums and alveoli								1	1
Necrosis of alveoli								1	1
Toothache								34	34
Inflammation of the tongue		1	1					3	4
Sore throat								52	52
Inflammation of tonsils—									
Follicular		8	6	2				34	42
Suppuration		4	4					2	6
Elongated uvula								4	4
Inflammation of salivary glands.		1	1					1	2
Inflammation of the pharynx—									
Catarrhal		2	1	1				46	48
Granular								21	21
Follicular								2	2
Stricture of the œsophagus.								1	1
Inflammation of the stomach—Catarrhal		18	10	7	1			40	58
Ulceration of the stomach—Superficial		2			1		1		2
Hyperæmia of the stomach.								1	1
Indigestion		6	5	1				200	206
Pyrosis								3	3
Nausea								1	1
Gastralgia								7	7
Loss of appetite								5	5
Inflammation of the intestines—									
Enteritis		4	3				1	22	26
Typhlitis	1	4	5					2	7
Colitis								2	2
Catarrhal		3	3					15	1
Ulceration of the intestines	1		1						18
Fæcal accumulation		1	1						1
Tympanitis								1	1
Hernia		10	4	4	2			88	98
Stricture of the intestines.	1		1						1
Intestinal dyspepsia.								8	8
Constipation		1	1					182	183
Colic		4	4					16	20

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES
TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

SOUTH ATLANTIC—Continued.

[illegible]

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

SOUTH ATLANTIC—Continued.

Diseases.	Number of cases.									
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.	
			Recovered.	Improved.	Not improved.	Died.				
Injuries—Continued.										
LOCAL INJURIES—Continued.										
Contusion of eyeball.....								1		1
Foreign bodies in the conjunctiva or cornea.....		1			1					13
Wound of eyeball.....		3	1	2				12	3	6
Foreign body in external meatus.....								1	1	1
Wound of neck.....								1	1	1
Foreign body in the air passages.....								1	1	1
Contusion of chest.....		4	3	1					7	11
Fracture of ribs.....		6	3	2			1	2	2	8
Penetrating wound of pleura or lung.....								1	1	1
Contusion of back.....		8	6	2				11	19	19
Sprain of back.....		3	2	1				8	11	11
Rupture of liver.....		1	1					1	1	2
Wound of parietes of abdomen.....		1				1				1
Contusion of testicle.....		1		1					3	4
Contusion of upper extremities.....		14	13	1				49	63	63
Sprain of shoulder.....									3	3
Sprain of wrist.....		2	2					10	12	12
Sprain of thumb.....								1	1	1
Sprain of fingers.....								1	1	1
Wound of upper extremities.....	1	36	27	9			1	104	141	141
Wound of joint, upper extremities.....								1	1	1
Fracture of clavicle.....									3	3
Fracture of humerus.....		3	3					1	1	4
Fracture of bones of forearm—										
Radius.....		3	1	1	1			6		9
Ulna.....		3	1	2				1		4
Both bones.....		1	1							1
Fracture of carpus, metacarpus, or phalanges.....		2	1				1	1		3
Dislocation of clavicle.....		2	1	1						2
Dislocation of humerus.....		8	4	2	2			1		9
Dislocation of radius and ulna.....		1	1							1
Dislocation of phalanges of fingers.....								2		2
Contusion of lower extremities.....		23	11	10			2	29		52
Sprain of hip.....								1	1	1
Sprain of knee.....		5	4	1				4	9	9
Sprain of ankle.....		5	4	1				8	13	13
Sprain of foot.....								3	3	3
Wound of lower extremities.....	1	8	7	2				39	48	48
Wound of joint, lower extremities.....								2	2	2
Fracture of femur.....	1	5	3	3					6	6
Fracture of patella.....									1	1
Fracture of tibia.....		1	1					1	1	2
Fracture of tibia and fibula.....		7	2	1	1		3		7	7
Fracture of bones of foot—										
Of the metatarsus.....		2	1	1						2
Of the phalanges of the toes.....								1	1	1
Dislocation of femur.....		2		2				1		3
Dislocation of tibia.....	1		1						1	1
Dislocation of fibula.....		1	1							1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

GULF—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE NOSE.....		12	12					32	34
Inflammation of soft parts.....		1	1					32	34
Diseases of septum.....		1	1					6	7
Epistaxis.....		1	1					1	3
Inflammation of the naso-pharynx.....								4	4
DISEASES OF THE CIRCULATORY SYS- TEM.....	5	31	4	24	1	5	2	40	76
Endocarditis.....		1					1		1
Valvular disease.....	1	19		15	1	4		22	42
Degeneration of heart—Fatty.....								1	1
Hypertrophy of heart.....		2		2				1	3
Dilatation of heart.....								1	1
Syncope.....		1		1					1
Disordered action of the heart—									
Abnormal rapidity.....								7	7
Irregularity.....	1	3		3		1		7	11
Aneurysm of arteries.....	1	2	1	1			1	1	4
Varix.....	2	3	3	2					5
DISEASES OF THE RESPIRATORY SYSTEM.....	7	95	45	38	4	9	6	517	619
Inflammation of mucous membrane of larynx—catarrhal, acute.....		1		1				9	10
Bronchitis—									
Catarrhal, acute.....	1	29	16	11	1	1	1	422	452
Catarrhal, chronic.....		10	1	7	1		1	48	58
Spasmodic asthma.....		3	1	2				8	11
Hæmorrhage of lung—hæmoptysis.....		1			1				1
Pneumonia.....	2	20	20			2		2	24
Broncho-pneumonia.....		2		1		1			2
Phthisis—									
Acute.....		1				1		3	4
Tubercular.....	3	18		12	1	4	4	18	39
Pleurisy—									
Acute.....	1	8	6	3				6	15
Chronic.....		1		1				1	2
Empyema.....		1	1						1
DISEASES OF THE DIGESTIVE SYSTEM.....	6	144	114	24	4	3	5	766	916
Inflammation of the mouth.....								4	4
Ulceration of the mouth.....		1	1					2	3
Caries of dentine and cementum.....								21	21
Abscess of dental periosteum.....		2	2					5	7
Suppuration of alveoli.....								1	1
Ulceration of gums and alveoli.....								1	1
Toothache.....								17	17
Ulceration of the tongue.....								1	1
Sore throat.....		1	1					54	55
Inflammation of the tonsils—									
Follicular.....		5	4	1				20	25
Suppuration.....		1	1						1
Elongated uvula.....								1	1
Inflammation of the pharynx—									
Catarrhal.....		1	1					23	24
Follicular.....		1	1						1
Stricture of the œsophagus.....								2	2
Inflammation of the stomach, cat- arrhal.....		20	18	2				30	50
Ulceration of the stomach, super- ficial.....	2			1		1			2
Indigestion.....		6	4	2				173	179

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

GULF—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE SKIN—Continued.									
Zona.....		1	1					3	4
Pemphigus.....		1	1					2	3
Acne.....								6	6
Chilblain.....								58	58
Ulcer.....	3	17	12	7	1			12	32
Cicatrices.....		1	1						1
Boil.....		13	8	5				51	64
Carbuncle.....		2	1	1				8	10
Whitlow.....	1	3	3	1				13	17
Onychia.....								11	11
Corn.....								2	2
Cheloid.....								1	1
Pruritus.....								5	5
Xanthelasma.....		1		1					1
Injuries.....	6	214	150	51	7	1	11	420	640
GENERAL INJURIES.....									
Effects of heat—		13	9	4				8	21
Burns and scalds.....		11	8	3				8	19
Heat stroke.....		1	1						1
Effects of chemical irritants and corrosives.....		1		1					1
LOCAL INJURIES.....									
Wound of nerves.....	6	201	141	47	7	1	11	412	619
Contusion of muscles.....		1		1				2	2
Strain of muscles.....		1		1				3	4
Strain of tendons.....								1	1
Abrasion of skin.....								9	9
Wound of skin.....		1	1					1	2
Burn or scald of skin.....								3	3
Frostbite.....		17	9	3	5			29	46
Contusion of scalp.....		1	1					5	6
Wound of scalp.....		12	8	4				19	31
Fracture of the vault of skull.....		5	4			1			5
Fracture of the base of skull.....		1		1					1
Concussion of brain.....		2	2					1	3
Contusion of face.....								3	3
Foreign bodies in the nose, antrum, or other cavities.....		3	1	2				5	8
Contusion of eyelid.....								6	6
Wound of eyelid.....		1	1					3	4
Contusion of eyeball.....								2	2
Foreign bodies in the eyeball.....								1	1
Wound of eyeball.....		1	1						1
Contusion of pinna.....								3	3
Foreign body in external meatus.....								1	1
Contusion of neck.....								3	3
Wound of neck.....		1	1					1	2
Contusion of chest.....		6	6					20	26
Fracture of ribs.....		6	3	2			1	4	10
Wound of parietes of chest.....		2		1			1	3	5
Penetrating wound of pleura or lung.....									1
Gunshot wound of chest.....	1	1	1	1					2
Contusion of back.....		6	6					4	10
Sprain of back.....		5	2	3				40	45
Wound of back.....								1	1
Wound of parietes of abdomen.....		1	1					1	2
Contusion of the pelvis.....		1		1					1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

GULF—Continued.

Diseases.	Number of cases.							
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.
			Recovered.	Improved.	Not improved.	Died.		
Local Diseases—Continued.								
LOCAL INJURIES—Continued.								
Contusion of the perinæum, scro- tum, or penis								1
Wound of the male urethra, peri- næum, scrotum, testis, or penis		2	2					3
Wound of rectum								3
Contusion of testicle								2
Contusion of upper extremities		12	7	4			1	38
Sprain of shoulder								17
Sprain of elbow								1
Sprain of wrist		1	1					10
Sprain of hand								1
Sprain of thumb								1
Wound of upper extremities		36	21	12	2		1	62
Fracture of clavicle		2						2
Fracture of humerus				1			1	2
Fracture of bones of forearm—								
Radius		1	1					2
Ulna								2
Both bones		3	2				1	4
Fracture of carpus, metacarpus, or phalanges	1	3	3	1				5
Dislocation of clavicle		1	1					1
Dislocation of humerus		3	2	1				3
Dislocation of radius and ulna								1
Dislocation of phalanges of fingers								1
Contusion of lower extremities		22	20	2				47
Sprain of hip								1
Sprain of knee								9
Sprain of ankle		8	8					11
Wound of lower extremities	1	19	10	6			4	31
Fracture of femur		2	1				1	1
Fracture of tibia		2	2					2
Fracture of fibula		1	1					1
Fracture of tibia and fibula	1	5	6					1
Fracture of bones of foot—								
Of the tarsus	1		1					1
Of the metatarsus		1	1					1
Of the phalanges of the toes	1	1	2					3
Dislocation of foot		1	1					2

OHIO.

TOTAL CASES	42	963	648	230	32	33	62	3,060	4,065
General Diseases	19	431	276	100	27	22	25	1,392	1,842
Smallpox		17		1	16			1	18
Cowpox		1	1					18	19
Measles	1	2	3						3
Dengue		64	58	4	1	1		113	177
Mumps								5	5
Diphtheria		1	1					1	2
Simple continued fever		2	1	1					2
Enteric fever		16	11			4	1		16
Dysentery		9	8	1				11	20
Malarial fever:									
Intermittent	2	87	78	4		1	6	214	303
Remittent		15	13				2	5	20

[illegible]

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

OHIO—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE GENERATIVE SYS- TEM	1	46	26	17	—	—	4	166	213
Urethritis	—	—	—	—	—	—	—	2	2
Stricture of urethra, organic	—	10	1	9	—	—	—	29	39
Urethral fistula	—	1	1	—	—	—	—	—	1
Prostatorrhœa	—	—	—	—	—	—	—	2	2
Hypertrophy of the prepuce	—	1	1	—	—	—	—	—	1
Phimosis	—	7	6	—	—	—	1	3	10
Paraphimosis	—	—	—	—	—	—	—	1	1
Inflammation of the penis	—	1	—	1	—	—	—	—	1
Soft chancre	—	14	10	1	—	—	3	99	113
Pruritus of the scrotum	—	—	—	—	—	—	—	1	1
Varicocele	—	—	—	—	—	—	—	6	6
Hydrocele of tunica vaginalis	—	—	—	—	—	—	—	1	1
Inflammation of the testicle:	—	—	—	—	—	—	—	—	—
Acute orchitis	1	6	2	5	—	—	—	6	13
Chronic orchitis	—	—	—	—	—	—	—	2	2
Epididymitis	—	4	4	—	—	—	—	3	7
Abscess of testicle	—	1	1	—	—	—	—	—	1
Impotence	—	—	—	—	—	—	—	4	4
Inflammation of the ovary	—	—	—	—	—	—	—	1	1
Inflammation of the uterus	—	1	—	1	—	—	—	4	5
Retroflexion of the uterus	—	—	—	—	—	—	—	1	1
Leucorrhœa	—	—	—	—	—	—	—	1	1
DISEASES OF THE ORGANS OF LOCO- MOTION	—	27	22	4	—	—	1	73	100
Inflammation of the bones:	—	—	—	—	—	—	—	—	—
Osteitis	—	—	—	—	—	—	—	1	1
Periostitis	—	1	—	1	—	—	—	3	4
Caries	—	—	—	—	—	—	—	1	1
Inflammation of joints—Acute synov- itis	—	—	—	—	—	—	—	—	—
Suppuration of muscles	—	1	1	—	—	—	—	1	1
Myalgia	—	24	21	2	—	—	1	61	85
Inflammation of sheaths of tendons	—	—	—	—	—	—	—	1	1
Inflammation of bursæ, acute	—	1	—	1	—	—	—	4	5
Bunion	—	—	—	—	—	—	—	1	1
DISEASES OF THE CONNECTIVE TISSUE	1	16	12	3	—	1	1	20	37
Inflammation	—	10	7	2	—	1	—	12	23
Abscess	1	6	5	1	—	—	1	7	14
Edema	—	—	—	—	—	—	—	1	1
DISEASES OF THE SKIN	1	22	13	7	—	—	3	143	166
Erythema	—	—	—	—	—	—	—	1	1
Urticaria	—	—	—	—	—	—	—	7	7
Prickly heat	—	—	—	—	—	—	—	5	5
Eczema	1	1	1	1	—	—	—	27	29
Impetigo	—	—	—	—	—	—	—	1	1
Pityriasis rubra	—	—	—	—	—	—	—	1	1
Psoriasis	—	—	—	—	—	—	—	3	3
Sudamina	—	—	—	—	—	—	—	1	1
Herpes	—	—	—	—	—	—	—	9	9
Dermatitis herpetiformis	—	2	—	2	—	—	—	—	2
Acne	—	—	—	—	—	—	—	4	4
Sycosis	—	—	—	—	—	—	—	3	3
Area	—	—	—	—	—	—	—	1	1
Ulcer	—	14	8	3	—	—	—	—	—
Boil	—	3	2	1	—	3	—	42	56
Carbuncle	—	2	2	—	—	—	—	23	26
Whitlow	—	—	—	—	—	—	—	3	5
Onychia	—	—	—	—	—	—	—	7	7
Corn	—	—	—	—	—	—	—	4	4

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

OHIO—Continued.

Diseases.	Number of cases.								
	Remaining under treatment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treatment at close of year.	Number furnished office relief.	Number treated in hospital and dispensary.
			Recovered.	Improved.	Not improved.				
Injuries.....	9	161	125	38	1	1	5	227	397
GENERAL INJURIES.....	2	11	11	2				5	18
Effects of heat, burns and scalds.....		11	9	2				5	16
Effects of chemical irritants and corrosives.....	2		2						2
LOCAL INJURIES.....	7	150	114	36	1	1	5	222	379
Contusion of kidney.....								1	1
Contusion of muscles.....		1		1					1
Strain of muscles.....		1	1					5	6
Strain of tendons.....								1	1
Contusion of skin.....		1		1					1
Abrasion of skin.....								1	1
Wound of skin.....	2		1	1				2	4
Frostbite.....	12	10	2	1				14	26
Wound of scalp.....	6	5	1					6	12
With injury to the bone.....	1	1							1
Fracture of the vault of skull.....	1	1							1
Fracture of the base of skull.....	1			1					1
Concussion of brain.....	1	1							1
Contusion of brain.....								2	2
Contusion of face.....								1	1
Wound of face and mouth.....	2		3					5	8
Fracture of facial bones.....	2		1	1					2
Lower jaw.....	1	1							1
Wound of conjunctiva.....								1	1
Foreign bodies in the conjunctiva or cornea.....								5	5
Contusion of neck.....		1	1					1	2
Dislocation of costal cartilages.....		4	3	1				7	11
Fracture of sternum.....		4	3				1	6	10
Contusion of back.....		3	3					8	11
Sprain of back.....	1	9	9	1				24	34
Wound of back.....		4	2	2					4
Concussion of cord.....								1	1
Contusion of abdomen.....	2	2							2
Wound of parietes of abdomen.....	1	1							1
Contusion of testicle.....	1	1							1
Contusion of upper extremities.....	9	6		3				34	43
Sprain of shoulder.....	2	2						2	4
Sprain of elbow.....								1	1
Sprain of wrist.....	1			1				6	7
Wound of upper extremities.....	8	6		1		1		35	43
Fracture of clavicle.....	1	1							1
Fracture of humerus.....	2			2				2	4
Fracture of bones of forearm, ulna.....	2			2				2	4
Fracture of carpus, metacarpus, or phalanges.....	1				1			2	3
Dislocation of clavicle.....	1	1						1	2
Dislocation of phalanges of fingers.....								1	1
Contusion of lower extremities.....	19	11		7			1	16	35
Sprain of hip.....	1	1							1
Sprain of knee.....	3	3						3	6
Sprain of ankle.....	2	13	10	4			1	12	27
Sprain of foot.....	1	1							1
Wound of lower extremities.....	3	11	11	3				7	21
Fracture of femur.....	1	1							1
Fracture of patella.....	2		2						2
Fracture of tibia.....	1						1		1
Fracture of fibula.....	2		1				1		2
Fracture of tibia and fibula.....	1	1	1	1				7	15

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

MISSISSIPPI.

Diseases.	Number of cases.								
	Remaining under treatment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treatment at close of year.	Number furnished office relief.	Number treated in hospital and dispensary.
			Recovered.	Improved.	Not improved.				
TOTAL CASES.....	59	1,187	756	358	22	39	71	3,254	4,500
General Diseases.....	27	692	425	217	11	25	41	2,233	2,952
Smallpox.....		6	4		2			880	886
Cowpox.....		2	5	3				19	27
Measles.....		2	2					1	3
Influenza.....		42	34	6	1	1		70	112
Mumps.....								1	1
Simple continued fever.....		1	1						1
Enteric fever.....	1	7	7				1		8
Epidemic diarrhea.....	2	2	2						2
Dysentery.....		10	10					1	11
Malarial fever:									
Intermittent.....	5	319	253	49	3	6	13	417	741
Remittent.....		32	26	1	1	1	3	3	35
Erysipelas.....		4	4						6
Tubercle.....	8	43		28		13	10	51	102
Syphilis:									
Primary.....		2	1	1				6	8
Secondary.....	7	105	2	98	2	2	8	232	334
Gonorrhea.....	2	20	15	7				287	309
Diseases dependent on animal parasites.								2	2
Tænia solium.....		4	3				1		4
Sarcoptes scabiei.....		1		1				3	4
Diseases dependent on vegetable parasites, trichophyton tonsurans.....		1		1				2	3
Effects of vegetable poisons.....							1		1
Effects of heat.....		1	1						1
Alcoholism.....		9	8				1	5	14
Rheumatic fever.....	1	6	4	3				1	8
Rheumatism.....	2	63	41	19	1		4	232	297
New growth, nonmalignant:									
Fibroma.....		1	1					2	3
Papilloma.....								3	3
New growth, malignant:									
Sarcoma.....	1	1			1	1			2
Squamous carcinoma.....		2	1			1			2
Anæmia.....									8
Diabetes mellitus.....								3	3
Debility.....								11	11
Local Diseases.....	19	342	212	108	9	13	19	817	1,178
DISEASES OF THE NERVOUS SYSTEM.....	1	13	7	5			2	26	40
Of the nerves—									
Inflammation, neuritis.....	1			1					1
Of the brain and its membranes—									
brain—									
Inflammation.....		1	1						1
Functional nervous disorders, with other diseases of undetermined nature.....									
Paralysis—									
Hemiplegia.....		1					1		1
Local paralysis.....		1		1					1
Epilepsy.....		5	1	3			1		5
Headache.....				3				4	4
Neuralgia.....		3	3					20	23
Hiccough.....		1	1					2	3
Mental diseases—									
Mental stupor.....		1	1						1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES
TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

MISSISSIPPI—Continued.

[illegible]

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

THE GREAT LAKES—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
General Diseases—Continued.									
Diseases dependent on vegetable para- sites:									
Achorion Schönleini.								1	1
Trichophyton tonsurans.	2	1	1	2				10	13
Microsporon furfur.								6	6
Effects of animal poisons—decayed and poisonous food.		3	3						3
Effects of vegetable poisons:									
Croton oil.		1		1					1
Opium.								1	1
Rhus toxicodendron.		1	1						1
Effects of inorganic poisons:									
Arsenic.		1				1			1
Lead.		2	1	1				1	3
Effects of the presence of foreign bodies.		1		1				2	3
Effects of heat.		2	1				1		2
Alcoholism.		37	31	2		1	1	34	71
Rheumatic fever.	3	21	16	6	1		1	10	34
Rheumatism.	10	116	86	35	3		2	670	796
Osteoarthritis.		2		2					2
Cyst:									
Mucous.								2	2
Sebaceous.		1	1					9	10
New growth, nonmalignant:									
Lipoma.		2	2						2
Fibroma.								7	7
Chondroma.								1	1
Myxoma.	1	1	1	1				4	6
Myoma.		1		1				3	4
Papilloma.		2	1		1			22	24
Adenoma.	1		1						1
New growth, malignant:									
Carcinoma.		6	1	1	1	3		4	10
Squamous carcinoma.		2	1	1					2
Anæmia.		1	1					6	7
Idiopathic anæmia.		1		1					1
Purpura.								2	2
Diabetes mellitus.		1		1				9	10
Diabetes insipidus.								4	4
Congenital malformations.								1	1
Debility.		9	3	6				124	133
Local Diseases.	51	742	427	264	21	31	50	4,707	5,500
DISEASES OF THE NERVOUS SYSTEM.	7	52	22	22	2	3	10	266	325
Of the nerves—									
Inflammation—									
Neuritis.		4	4					26	30
Multiple neuritis.		2		1			1	2	4
Degeneration.	1			1					1
Of the spinal cord and membranes—									
Cord—									
Inflammation.								3	3
Degeneration—									
Of lateral columns.		2		1			1	1	3
Of posterior columns.	2						2	4	6
Insular sclerosis.		1					1		1
Of the brain and its membranes—									
Membranes—									
Inflammation—									
Of dura mater.		1				1			1
Of pia mater and arachnoid.		1	1						

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

THE GREAT LAKES—Continued.

Diseases.	Number of cases.								
	Remaining under treatment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treatment at close of year.	Number furnished office relief.	Number treated in hospital and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE NERVOUS SYSTEM—Continued.									
Of the brain and its membranes—Continued.									
Brain—									
Hemorrhage		1					1		1
Hyperæmia								1	1
Anæmia								10	10
Functional nervous disorders with other diseases of undetermined nature:									
Paralysis—									
Hemiplegia	3	2		2		2	1	3	8
Local paralysis		6	2	4				10	16
Incomplete paralysis		2		1	1			5	7
Chorea								1	1
Spasm								5	5
Facial spasm								1	1
Epilepsy		3		3				1	4
Vertigo		1		1				16	17
Headache								30	30
Hyperæsthesia								3	3
Anæsthesia								3	3
Neuralgia	1	19	14	2	1		3	93	113
Hysteria		1		1					1
Nervous weakness		4		4				46	50
Mental diseases—									
Mania		1	1						1
Melancholia		1		1				2	3
DISEASES OF THE EYE									
		21	9	11			1	116	137
Conjunctivitis		1		1				7	8
Acute		11	6	5				75	86
Purulent		1		1					1
Keratitis		2	1	1				1	3
Ulceration of cornea		3	2				1	1	4
Opacity of cornea								1	1
Iritis		1		1				6	7
Choroiditis								2	2
Atrophy and degeneration of optic nerve or papilla								1	1
Retinitis								2	2
Lenticular cataract								1	1
Capsular cataract								3	3
Opacity of the vitreous humour								1	1
Panophthalmitis		1		1					1
Hemorrhage into the vitreous-humour									
Sty								1	1
Trichiasis								6	6
Entropion		1		1				4	4
Edema of the eyelid								3	4
								1	1
DISEASES OF THE EAR									
		1	1					67	68
Inflammation of the external meatus—									
Acute								3	3
Chronic								1	1
Abscess								2	2
Accumulation in external meatus of wax or epidermis									
		1	1					20	21
Inflammation of the middle ear—									
Nonsuppurative								15	15
Suppurative								12	12

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

THE GREAT LAKES—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE EAR—Continued.									
Inflammation of the middle ear—Continued.									
Ulceration of membrana tympani								1	1
Perforation of membrana tympani								2	2
Obstruction of Eustachian tube								1	7
Tinnitus								1	1
Deafness								3	3
DISEASES OF THE NOSE								88	88
Inflammation of soft parts								88	88
Diseases of septum		1	1					3	4
Epistaxis		1	1					2	3
Inflammation of the nasopharynx								1	1
DISEASES OF THE CIRCULATORY SYSTEM	11	50	6	43	4	6	2	98	159
Pericarditis		1		1				2	3
Valvular disease	7	33		30	3	5	2	44	84
Degeneration of heart, fatty		1		1					1
Hypertrophy of heart		2		2				4	6
Excessive growth of fat of heart		1		1					1
Angina pectoris		2		2				7	9
Disordered action of the heart								1	1
Abnormal rapidity		1		1				16	17
Irregularity								15	15
Arteritis, endarteritis	1	1		1		1			2
Aneurysm of arteries		1		1				1	2
Obstruction of arteries, thrombosis		1		1					1
Phlebitis		2	1		1			2	4
Varix	3	4	5	2				6	13
DISEASES OF THE RESPIRATORY SYSTEM	5	142	74	55	4	8	6	1,040	1,187
Hay fever								2	2
Inflammation of mucous membrane of larynx—									
Catarrhal, acute		3	2	1				21	24
Catarrhal, chronic								6	6
Tracheitis		1	1						1
Bronchitis—									
Catarrhal, acute	2	54	40	13	1	1	1	687	743
Catarrhal, chronic		14	3	10	1			165	179
Membranous								34	34
Congestion of lung		1	1					3	4
Hemorrhage of lung—hæmoptysis	1			1				6	7
Pneumonia		22	10	4		5	3	1	23
Broncho-pneumonia		3	3						3
Phthisis—									
Chronic								8	8
Tubercular	1	25		20	2	2	2	69	95
Pleurisy—									
Acute	1	14	13	2				34	49
Chronic		3	1	2				4	7
Empyema		2		2					2
DISEASES OF THE DIGESTIVE SYSTEM.	6	162	107	41	6	10	4	1,320	1,488
Ulceration of the lips								1	1
Inflammation of the mouth								3	3
Ulceration of the mouth		1		1				4	5
Gangrene of the mouth								1	1

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

THE GREAT LAKES—Continued.

Diseases.	Number of cases.								
	Remaining under treatment from previous year.	Admitted during year.	Discharged.			Died.	Remaining under treatment at close of year.	Number furnished office relief.	Number treated in hospital and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Caries of dentine and cementum								18	18
Inflammation of dental periosteum								1	1
Abscess of dental periosteum								6	6
Inflammation of gums and alveoli								5	5
Suppuration of alveoli		1	1					3	4
Ulceration of gums and alveoli								3	3
Toothache								6	6
Sore throat								44	44
Ulceration of the tonsils		1	1						1
Inflammation of tonsils—									
Follicular		21	21					76	97
Suppuration		4	2	1	1			6	10
Hypertrophy of tonsils								3	3
Elongated uvula								5	5
Inflammation of salivary glands								1	1
Inflammation of the pharynx—									
Catarrhal		1		1				46	47
Granular								2	2
Follicular		2	2					23	25
Dysphagia								1	1
Inflammation of the stomach—catarrhal	2	24	15	7	2	2		194	220
Dilatation of the stomach	1	4		4			1		5
Indigestion	1	4	3	1	1			195	200
Pyrosis								19	19
Vomiting								3	3
Gastralgia								3	3
Loss of appetite								19	19
Inflammation of the intestines—									
Enteritis		12	10			2		10	22
Typhlitis		6	3	1		2		2	8
Colitis								7	7
Catarrhal		11	10	1				21	32
Fæcal accumulation		2	2					7	9
Hernia	1	10	6	4	1			136	147
Stricture of the intestines		1		1				1	2
Obstruction of the intestines		1		1					1
Intestinal dyspepsia								3	3
Constipation		1				1		153	154
Colic		9	6	3				11	20
Diarrhea		11	7	2		1	1	123	134
Enteralgia								1	1
Periproctitis								2	2
Abscess		4		3			1	4	8
Ulceration of the anus								1	1
Fissure of the anus		1	1					3	4
Fistula in ano		9	6	2	1			11	20
Prolapse of the rectum								1	1
Piles									
External		3	2	1				28	31
Mixed		4		3			1	21	25
Pruritus ani								8	8
Inflammation of the liver—acute								12	12
Acute suppuration								6	6
Chronic		1		1				2	3
Hyperæmia of the liver		2	2					30	32
Hypertrophy of the liver								5	5
Jaundice	1	3	3	1				7	11
Inflammation of hepatic ducts and gall bladder		4	2	1		1		1	5

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

THE GREAT LAKES—Continued.

Diseases.	Number of cases.									
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.	
			Recovered.	Improved.	Not improved.					
Local Diseases—Continued.										
DISEASES OF THE DIGESTIVE SYSTEM—Continued.										
Accumulation of bile								7	7	
Calculi								2	2	
Biliary colic		12	1	1				3	5	
Inflammation of the peritoneum		12	1			1			2	
DISEASES OF THE LYMPHATIC SYSTEM.										
Splenitis	5	27	22	7	2		1	80	112	
Hypertrophy of spleen		1			1			1	2	
Inflammation of lymph glands	2	19	15	5			1	54	75	
Suppuration	3	7	7	2	1			18	28	
Hypertrophy of lymph glands								2	2	
Inflammation of lymphatics								3	3	
Dilatation of lymphatics								1	1	
DISEASES OF THE THYROID BODY										
Hypertrophy								10	10	
Goiter								1	1	
								9	9	
DISEASES OF THE URINARY SYSTEM										
Acute nephritis	3	22	9	12		3	1	156	181	
Bright's disease		1	1					23	24	
Abscess—Perinephritic	1	5		4		2	1	30	37	
Congestion of kidney				1					1	
Calculus in ureter								2	2	
Albuminuria		1	1					1	1	
Inflammation of bladder—								2	3	
Acute		10	6	4				53	63	
Subacute								10	10	
Chronic		5	1	3		1		22	27	
Calculus of bladder								1	1	
Irritability of bladder								9	9	
Incontinence of urine								3	3	
DISEASES OF THE GENERATIVE SYSTEM										
Urethritis	4	97	56	35	1		9	509	610	
Gleet								53	53	
Hæmorrhage of the urethra								25	25	
Stricture of urethra—								3	3	
Organic	1	27	15	12			1	87	115	
Spasmodic								2	2	
Urethral fistula		1		1				1	2	
Inflammation of the prostate—										
Acute		2		2				2	4	
Chronic								1	1	
Prostatorrhœa								1	1	
Hypertrophy of the prostate		1					1	1	2	
Inflammation of the vesiculæ semi- nalis										
Posthitis								1	1	
Oedema of prepuce								2	2	
Phimosis		11	8	2			1	8	19	
Paraphimosis		1	1					2	3	
Inflammation of the penis								1	1	
Of the glans		1	1					38	39	
Soft chancre		25	13	8	1		3	155	180	
Abscess of the scrotum								2	2	
Pruritus of the scrotum								1	1	
Inflammation of the spermatic cord								7	7	
Hydrocele of the spermatic cord		1					1	6	7	
Varicocele	1	3	3	1				25	29	
Hydrocele of tunica vaginalis		1		1				10	11	

THE GREAT LAKES—Continued.

[illegible]

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

PACIFIC.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
TOTAL CASES	94	1,526	909	491	40	79	101	4,250	5,870
General Diseases	46	587	294	248	7	42	42	1,664	2,297
Smallpox	—	1	1	—	—	—	—	—	1
Measles	—	26	17	2	—	7	—	5	31
Rubella	—	3	3	—	—	—	—	—	3
Scarlet fever	—	1	1	—	—	—	—	—	1
Influenza	1	42	29	13	—	1	—	100	143
Mumps	—	9	9	—	—	—	—	12	21
Cerebro-spinal fever	—	5	2	—	—	3	—	—	5
Simple continued fever	—	—	—	—	—	—	—	2	2
Enteric fever	7	38	37	4	—	3	1	8	53
Choleraic diarrhœa	—	1	—	1	—	—	—	—	1
Dysentery	—	11	8	—	—	2	1	9	20
Malarial fever:	—	—	—	—	—	—	—	—	—
Intermittent	1	29	27	2	—	1	1	53	83
Romittent	—	7	5	2	—	—	—	—	7
Erysipelas	1	6	6	1	—	—	—	4	11
Tubercle	14	80	—	54	5	20	15	61	155
Leprosy	—	1	—	1	—	—	—	—	1
Syphilis:	—	—	—	—	—	—	—	—	—
Primary	2	4	—	6	—	—	—	23	29
Secondary	2	73	—	76	1	—	5	397	479
Gonorrhœa	3	76	48	22	—	—	9	596	675
Diseases dependent on animal para- sites:	—	—	—	—	—	—	—	—	—
Amœba coli	—	1	1	—	—	—	—	—	1
Tœnia solium	—	—	—	—	—	—	—	3	3
Tœnia mediocanellata	—	—	—	—	—	—	—	1	1
Ascaris lumbricoides	—	—	—	—	—	—	—	1	1
Phthirius inguinalis	—	—	—	—	—	—	—	1	1
Sarcoptes scabiei	—	1	1	—	—	—	—	3	4
Diseases dependent on vegetable para- sites—Trichoyton tonsurans	—	—	—	—	—	—	—	6	6
Effects of vegetable poisons:	—	—	—	—	—	—	—	—	—
Opium	—	—	—	—	—	—	—	4	4
Tobacco	—	1	—	1	—	—	—	—	1
Poison oak	—	—	—	—	—	—	—	1	1
Effects of inorganic poisons	—	—	—	—	—	—	—	2	2
Effects of the presence of foreign bodies.	—	—	—	—	—	—	—	1	1
Alcoholism	—	15	12	2	—	1	—	25	40
Rheumatic fever	2	24	15	10	—	—	1	6	32
Rheumatism	4	101	61	38	—	—	6	292	397
Gout	—	2	—	—	—	—	2	—	2
Osteoarthritis	1	1	—	2	—	—	—	2	4
Cyst—sebaceous	—	3	3	—	—	—	—	2	5
New growth, nonmalignant:	—	—	—	—	—	—	—	—	—
Lipoma	—	4	4	—	—	—	—	3	7
Myxoma	—	2	1	1	—	—	—	—	2
Papilloma	—	1	—	1	—	—	—	17	18
New growth, malignant:	—	—	—	—	—	—	—	—	—
Sarcoma	1	—	—	—	—	1	—	—	1
Carcinoma	—	3	—	1	—	2	—	2	5
Squamous carcinoma	—	—	—	—	—	—	—	1	1
Anæmia	—	1	1	—	—	—	—	—	1
Hæmophilia	—	1	—	1	—	—	—	1	2
Diabetes mellitus	—	2	—	1	—	1	—	2	4
Diabetes insipidus	—	1	—	—	—	—	1	—	1
Debility	—	10	2	7	1	—	—	18	28

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

PACIFIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases	34	611	383	168	26	29	39	2,020	2,665
DISEASES OF THE NERVOUS SYSTEM	6	28	15	11	3	1	4	100	134
Of the nerves:									
Inflammation—									
Neuritis		5	3	2				6	11
Multiple neuritis		1				1		2	3
Of the spinal cord and membranes—									
Cord:									
Inflammation—local		1		1					1
Degeneration—									
Of lateral columns	1						1		1
Of posterior columns	3				1		2		3
Of lateral and posterior col- umns	1				1				1
Of the brain and its membranes—									
Brain—									
Abscess								1	1
Functional nervous disorders, with other diseases of undetermined nature—									
Paralysis—									
Paraplegia								1	1
Hemiplegia		1	1					2	3
Local paralysis								2	2
Incomplete paralysis	1						1	1	2
Paralysis agitans		1		1				1	2
Epilepsy		2		2				14	16
Tetany								1	1
Vertigo								1	1
Headache		2	1	1				6	8
Anæsthesia								1	1
Neuralgia		13	10	3				51	64
Nervous weakness								7	7
Mental diseases—									
Melancholia		2		1	1			1	3
Dementia								2	2
DISEASES OF THE EYE	3	15	4	7	4		3	47	65
Conjunctivitis—									
Acute		3	2	1				34	37
Chronic								1	1
Keratitis		1	1	1					1
Ulceration of cornea	1	2	1	1	1			1	4
Iritis		4	1	2	1			2	6
Glaucoma		1					1		1
Atrophy and degeneration of optic nerve or papilla	2	1		1			2		3
Lenticular cataract		3		1	2			2	5
Amblyopia—functional night blind- ness									1
Blepharitis marginalis								4	4
Trichiasis								1	1
Entropion								1	1
DISEASES OF THE EAR	2	8	8	2				33	43
Inflammation of the external me- atus—									
Acute								2	2
Abscess								1	1
Accumulation in external meatus of wax or epidermis		1	1					11	12
Inflammation of the middle ear—									
Nonsuppurative		3	2	1				3	6
Suppurative	2	4	5	1				16	22

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

PACIFIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE NOSE.									
Inflammation of soft parts								18	18
Diseases of septum		2	2					18	18
Epistaxis		1	1					5	7
Inflammation of the accessory si- nuses		1	1					2	3
Inflammation of the naso-pharynx								1	2
								2	2
DISEASES OF THE CIRCULATORY SYS- TEM.									
Hydropericardium	3	50	9	23	3	11	7	64	117
Endocarditis		1				1			1
Valvular disease		1	1						1
Inflammation of heart	2	28		15	2	7	6	29	59
Hypertrophy of heart								2	2
Dilatation of heart		1		1				3	4
Disordered action of the heart—		1		1				1	2
Abnormal rapidity									
Irregularity		2		2				2	2
Aneurysm of arteries		2		1				8	10
Phlebitis		2	1			2		5	8
Varix	1	10	6	3	1			1	3
Nævus		1	1					13	24
									1
DISEASES OF THE RESPIRATORY SYS- TEM.									
Inflammation of mucous membrane of larynx—	5	99	69	23	5	4	3	403	507
Catarrhal, acute		4	2	2				23	27
Catarrhal, chronic								7	7
Bronchitis—									
Catarrhal, acute	1	33	27	6	1			287	321
Catarrhal, chronic		10	6	3		1		45	55
Spasmodic asthma								10	10
Pneumonia	2	24	22	1		3		4	30
Broncho pneumonia		1	1						1
Phthisis—									
Acute								1	1
Chronic		1			1				1
Emphysema		3		3				1	4
Pleurisy—									
Acute		17	8	5	2		2	17	34
Chronic	1	5	2	3	1			8	14
Empyema	1	1	1				1		2
DISEASES OF THE DIGESTIVE SYSTEM.									
Inflammation of the mouth	1	139	94	26	6	6	8	553	693
Caries of dentine and cementum								1	1
Necrosis of cementum								9	9
Abscess of dental periosteum		3	3					1	1
Inflammation of gums and alveoli		1	1					6	9
Ulceration of gums and alveoli								1	1
Necrosis of the alveoli								2	2
Toothache								4	4
Sore throat								1	1
Inflammation of tonsils—								49	49
Follicular									
Suppuration		11	11					24	24
Inflammation of the pharynx—								5	16
Catarrhal									
Granular								14	14
Follicular		1	1					4	4

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

PACIFIC—Continued.

Diseases.	Number of cases.								
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treat- ment at close of year.	Number furnished office relief.	Number treated in hospi- tal and dispensary.
			Recovered.	Improved.	Not improved.				
Local Diseases—Continued.									
DISEASES OF THE DIGESTIVE SYSTEM—Continued.									
Ulceration of pharynx.....		1	1					1	2
Inflammation of the stomach, catarrhal.....		37	20	9	2	1	5	99	136
Ulceration of the stomach.....		1		1					1
Indigestion.....		1	1					90	91
Eruetation of the stomach.....								1	1
Gastralgia.....		2	2					2	4
Loss of appetite.....								3	3
Inflammation of the intestines—									
Enteritis.....		12	1	1				12	14
Typhlitis.....			4	2		1		3	10
Catarrhal.....		12	2					12	14
Concretions in the intestines.....		1	1						1
Fæcal accumulation.....		1	1						1
Hernia.....		20	15	2	1		2	82	102
Constipation.....		4	3	1				36	40
Colic.....		2	2					4	6
Diarrhœa.....		2	1	1				28	30
Enteralgia.....		2	2						2
Periproctitis, abscess.....		1	1					2	3
Fistula in ano.....		9	7		1		1	5	14
Ulceration of the rectum.....		2	2					2	4
Piles—									
Internal.....		3	2	1				7	10
External.....		5	2	3				23	28
Mixed.....		4	3		1			2	6
Pruritis ani.....								4	4
Inflammation of the liver—									
Acute.....		2	1		1				2
Chronic.....	1	2		5		4		3	12
Jaundice.....								3	3
Inflammation of hepatic ducts and gall bladder—									
Calculi.....		3	3					3	6
Accumulation of bile.....								2	2
Biliary colic.....		1	1					1	2
Inflammation of the peritoneum.....								2	2
Dropsy.....								1	1
DISEASES OF THE LYMPHATIC SYSTEM.....	1	25	19	5	2			37	63
Perisplenitis.....		1			1				1
Inflammation of lymph glands—suppuration.....		16	11	4	1			24	40
Hypertrophy of lymph glands.....	1	8	8	1				13	22
DISEASES OF THE THYROID BODY.....								3	3
Hypertrophy.....								2	2
Goitre.....								1	1
DISEASES OF THE URINARY SYSTEM.....	2	30	2	19		7	4	33	65
Acute nephritis.....	1	2		2			1	1	4
Bright's disease.....	1	20		12		6	3	6	27
Pyelitis.....		1		1					1
Congestion of kidney.....		1				1			1
Calculus in kidney.....								1	1
Hæmaturia.....								1	1
Inflammation of bladder—									
Acute.....		1	1					14	15
Subacute.....		1		1					1
Chronic.....		4	1	3				3	7

TABLE VII.—TAIULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES
TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

PACIFIC—Continued.

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TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

PACIFIC—Continued.

Diseases.	Number of cases.							
	Remaining under treat- ment from previous year.	Admitted during the year.	Discharged.				Remaining under treat- ment at close of year.	Number furnished office relief.
			Recovered.	Improved.	Not improved.	Died.		
Injuries—Continued.								
LOCAL INJURIES—Continued.								
Wound of neck		2	1			1		1
Compression of chest								2
Contusion of chest		13	10	3				31
Fracture of ribs		19	12	6		1		9
Fracture of sternum		3	1	1				
Gunshot wound of the chest		3	2			1		
Contusion of back		15	7	7		1		10
Sprain of back		8	4	1			3	23
Wound of back								3
Simple fracture of spine, with in- jury to spinal cord and nerves						1		
Contusion of abdomen		2	1	1				3
Contusion of spinal cord		1		1				3
Wound of the male urethra, peri- neum, scrotum, testis, or penis								1
Contusion of testicle		2	1	1				3
Contusion of upper extremities	1	11	7	2	2		1	44
Sprain of shoulder		2	2					4
Sprain of elbow		1	1					4
Sprain of wrist		2	1				1	8
Sprain of thumb								1
Wound of upper extremities		26	19	6	1			170
Wound of joint, upper extremities		1		1				
Fracture of clavicle		4	3					
Fracture of scapula		2	1	1				
Fracture of humerus		6	4	2				1
Fracture of bones of forearm—								
Radius		3	1	2				
Ulna		1	1					2
Both bones		2	1	1				
Fracture of carpus, metacarpus, or phalanges	1	7	5	3				9
Dislocation of clavicle		2	2					
Dislocation of humerus		5	3	1			1	1
Dislocation of radius and ulna		1	1					1
Dislocation of carpus		1	1					1
Dislocation of phalanges of thumb								1
Dislocation of phalanges of fingers								2
Contusion of lower extremities	1	43	33	11				75
Sprain of hip								1
Sprain of knee	1	3	1	3				8
Sprain of ankle	1	14	11	3			1	20
Sprain of foot	1	1	2					
Wound of lower extremities		15	12	1		1	1	29
Wound of joint, lower extremities		1	1					
Fracture of femur	2	5	3		1		3	
Fracture of patella		4	2	2				
Fracture of tibia		6	2	2			3	1
Fracture of tibia and fibula	1	13	9	3	1		1	1
Fracture of bones of foot		11	7	1		1	2	
Of the tarsus		1	1					
Of the metatarsus		5	3	1			1	1
Of the phalanges of the toes		6	4	1			1	2
Dislocation of tibia		1					1	
Dislocation of foot		1	1					

TABLE VII.—TABULAR STATEMENT, BY DISTRICTS, OF DISEASES AND INJURIES TREATED DURING THE YEAR ENDED JUNE 30, 1899—Continued.

QUARANTINE.

Diseases.	Number of cases.								
	Remaining under treatment from previous year.	Admitted during the year.	Discharged.			Died.	Remaining under treatment at close of year.	Number furnished office relief.	Number treated in hospital and dispensary.
			Recovered.	Improved.	Not improved.				
TOTAL CASES.....	2	85	65	20	1	1	138	225	
General Diseases.....	2	72	59	13	1	1	70	144	
Smallpox.....		4	4					4	
Cowpox.....								8	
Dengue.....		3	3					7	
Influenza.....		1	1					4	
Simple continued fever.....		1	1					1	
Enteric fever.....		12	12					3	
Choleraic diarrhoea.....		1	1					1	
Dysentery.....		5	3	2			6	11	
Yellow fever.....		19	18		1			19	
Beriberi.....		2		2				2	
Malarial fever:									
Intermittent.....	1	20	17	3		1	25	46	
Remittent.....	1	8	8	1				9	
Tubercle.....								2	
Syphilis, secondary.....		2		2				8	
Gonorrhoea.....		3		3				10	
Rheumatism.....								10	
Debility.....		1	1					7	
Local Diseases.....		11	4	7			60	4	
DISEASES OF THE NERVOUS SYSTEM.....		1		1				1	
Of the nerves—									
Neuritis.....		1		1				1	
DISEASES OF THE EAR.....							1	1	
Accumulation in external meatus of wax or epidermis.....							1	1	
DISEASES OF THE NOSE.....							1	1	
Inflammation of soft parts.....							1	1	
DISEASES OF THE RESPIRATORY SYSTEM.....							5	5	
Inflammation of mucous membrane of larynx.....							1	1	
Bronchitis—									
Catarrhal, acute.....							1	1	
Catarrhal, chronic.....							1	1	
Pleurisy—Chronic.....							2	2	
DISEASES OF THE DIGESTIVE SYSTEM.....		6	3	3			32	38	
Caries of dentine and cementum.....		1	1				2	3	
Abscess of dental periosteum.....							1	1	
Inflammation of gums and alveoli.....							1	1	
Toothache.....							1	1	
Inflammation of tonsils—Follicular.....							1	1	
Inflammation of the pharynx—Catarrhal.....							1	1	
Inflammation of the stomach—Catarrhal.....							2	2	
Indigestion.....							1	1	
Inflammation of the intestines—									
Colitis.....		1		1				1	
Catarrhal.....		1		1				1	
Fæcal accumulation.....		1	1				12	13	
Constipation.....							2	2	
Colic.....		1	1					1	
Diarrhoea.....		1		1			6	7	
Fistula in ano.....							1	1	
Piles, external.....							1	1	

TABLE VIII.—TABULATED STATEMENT, BY DISTRICTS, OF CAUSES OF MORTALITY AMONG PATIENTS OF THE SERVICE DURING THE YEAR ENDED JUNE 30, 1899.

Causes of death.	Total.	Districts.							
		North Atlantic.	Middle Atlantic.	South Atlantic.	The Gulf.	The Ohio.	Mississippi.	Great Lakes.	Pacific.
Total Deaths from all Causes.....	430	45	62	58	48	33	39	65	79
FROM DISEASES.....	407	45	64	55	47	32	38	57	74
FROM INJURIES.....	23	.....	1	3	1	1	1	8	5
General Diseases.....	239	30	35	37	21	22	25	26	42
Measles.....	7	.....	.....	.....	.....	.....	.....	.....	7
Dengue.....	1	.....	.....	.....	.....	1	.....	.....	.....
Influenza.....	5	.....	.....	2	1	.....	1	.....	1
Cerebro-spinal fever.....	6	.....	.....	1	1	.....	.....	1	3
Enteric fever.....	32	3	4	.....	3	4	.....	8	3
Dysentery.....	5	.....	.....	1	.....	.....	.....	.....	3
Yellow fever.....	12	.....	.....	.....	1	.....	.....	.....	1
Malarial fever:									
Intermittent.....	16	1	1	2	4	1	6	.....	1
Remittent.....	8	.....	1	5	1	.....	1	.....	.....
Erysipelas.....	1	.....	1	.....	.....	.....	.....	.....	.....
Tubercle.....	114	15	24	14	4	12	13	12	20
Syphilis:									
Primary.....	2	.....	.....	.....	.....	.....	2	.....	.....
Secondary.....	6	4	1	.....	1	.....	.....	.....	.....
Effects of vegetable poisons—opium.....	1	.....	.....	1	.....	.....	.....	.....	.....
Effects of inorganic poison:									
Arsenic.....	1	.....	.....	.....	.....	.....	.....	1	.....
Lead.....	1	1	.....	.....	.....	.....	.....	.....	.....
Alcoholism.....	5	1	.....	.....	1	.....	.....	1	1
Rheumatic fever.....	6	.....	.....	1	.....	3	.....	.....	.....
Rheumatism.....	2	1	.....	1	.....	.....	.....	.....	.....
Sarcoma.....	2	.....	.....	.....	.....	.....	1	.....	1
Carcinoma.....	9	2	1	1	.....	.....	.....	3	2
Squamous carcinoma.....	3	.....	.....	.....	2	.....	1	.....	.....
Diabetes mellitus.....	2	.....	1	.....	.....	.....	.....	.....	1
Debility.....	2	.....	1	1	.....	.....	.....	.....	.....
Local Diseases.....	168	15	26	18	26	10	13	31	29
DISEASES OF THE NERVOUS SYSTEM.....	13	2	2	3	2	.....	.....	3	1
Neuritis.....	2	.....	.....	1	.....	.....	.....	.....	1
Inflammation of brain.....	2	.....	1	.....	.....	.....	.....	1	.....
Hemorrhage.....	2	.....	1	.....	.....	.....	.....	.....	.....
Apoplexy.....	1	.....	.....	.....	1	.....	.....	.....	.....
Hemiplegia.....	2	.....	.....	.....	.....	.....	.....	.....	.....
Mania, acute.....	1	.....	.....	1	.....	.....	.....	.....	.....
Melancholia.....	1	1	.....	.....	.....	.....	.....	.....	.....
Dementia.....	2	1	.....	1	.....	.....	.....	.....	.....
DISEASES OF THE CIRCULATORY SYSTEM.....	39	6	5	1	5	1	4	6	11
Hydropericardium.....	1	.....	.....	.....	.....	.....	.....	.....	1
Endocarditis.....	2	1	1	.....	.....	.....	.....	.....	.....
Valvular disease—									
Aortic.....	12	4	3	1	4	.....	.....	.....	.....
Mitral.....	17	.....	.....	.....	.....	1	4	5	7
Hypertrophy of heart.....	1	.....	.....	.....	1	.....	.....	.....	.....
Endarteritis.....	2	1	.....	.....	.....	.....	.....	1	.....
Aneurism of arteries.....	2	.....	.....	.....	.....	.....	.....	.....	2
Embolism.....	1	.....	1	.....	.....	.....	.....	.....	.....
Phlebitis.....	1	.....	.....	.....	.....	.....	.....	.....	1
DISEASES OF THE RESPIRATORY SYSTEM.....	40	1	4	4	9	4	6	8	4
Bronchitis—									
Catarrhal, acute.....	5	.....	.....	2	1	.....	1	1	.....
Catarrhal, chronic.....	3	.....	1	.....	.....	.....	1	.....	1
Edema of lung.....	1	.....	1	.....	.....	.....	.....	.....	.....
Pneumonia.....	20	1	1	2	2	3	3	5	3
Broncho-pneumonia.....	1	.....	.....	.....	1	.....	.....	.....	.....
Phthisis—									
Acute.....	3	.....	.....	.....	1	1	1	.....	.....
Tubercular.....	6	.....	.....	.....	4	.....	.....	2	.....
Pleurisy—Acute.....	1	.....	1	.....	.....	.....	.....	.....	.....

TABLE VIII.—TABULATED STATEMENT, BY DISTRICTS, OF CAUSES OF MORTALITY AMONG PATIENTS OF THE SERVICE, ETC.—Continued.

Causes of death.	Total.	Districts.								
		North Atlantic.	Middle Atlantic.	South Atlantic.	The Gulf.	The Ohio.	Mississippi.	Great Lakes.	Pacific.	Quarantine.
Local Diseases—Continued.										
DISEASES OF THE DIGESTIVE SYSTEM.....	33	3	3	4	3	1	3	10	6	
Inflammation of stomach—Catarrhal.....	4	1						2	1	
Ulceration of the stomach—Superficial.....	1				1					
Enteritis.....	3							2		
Typhlitis.....	6		2				1	2	1	
Faecal accumulation.....	1				1					
Stricture of the intestines.....	1				1					
Obstruction of the intestines.....	1					1				
Constipation.....	1							1		
Diarrhea.....	3			2				1		
Inflammation of the liver—										
Acute.....	1		1							
Chronic.....	2	2		1			1		4	
Acute yellow atrophy of the liver.....	1						1			
Inflammation of hepatic ducts and gall bladder.....	1							1		
Inflammation of the peritoneum.....	2			1				1		
DISEASES OF THE URINARY SYSTEM.....	36	3	8	6	4	4		4	7	
Acute nephritis.....	1			1						
Bright's disease.....	27	3	5	4	4	2		3	6	
Pyelitis.....	2		1	1						
Calculus in kidney.....	1								1	
Suppression of urine.....	1		1							
Inflammation of bladder—Acute.....	4	1	1			2		1		
DISEASES OF THE ORGANS OF LOCOMOTION.....	7		4		3					
Necrosis.....	2		1		1					
Psoas, lumbar, and other abscesses.....	1		1							
Myalgia.....	4		2		2					
Injuries.....	23		1	3	1	1	1	8	8	
GENERAL INJURIES.....	1							1		
Shock.....	1							1		
LOCAL INJURIES.....	22		1	3	1	1	1	7	8	
Frostbite.....	1			1						
Fracture of the vault of skull.....	2				1			1		
Fracture of the base of skull.....	2					1		2		
Concussion of brain.....	2			1					1	
Wound of neck.....	1								1	
Wound of sternum.....	1								1	
Wound of the parietes of chest.....	1								1	
Gunshot wound of chest.....	1								1	
Sprain of back.....	1								1	
Fracture of spine.....	1							1		
Wound of parietes of abdomen.....	2			1					1	
Contusion of upper extremities.....	1						1			
Wound of upper extremities.....	1					1				
Wound of lower extremities.....	2							1	1	
Wound of joint of lower extremities.....	1		1							
Fracture of fibula.....	1							1		
Fracture of tibia and fibula.....	1							1		

TABLE IX.—SURGICAL OPERATIONS, FISCAL YEAR 1899.

Operations.	Number of cases.	Remarks.
Total Number of Operations	1,110	
OPERATIONS ON TUMORS	29	
Lipoma	5	Successful, 5.
Fibroma	5	Do.
Fibro-lipoma	1	Successful.
Chondroma	1	Of thumb, successful.
Enchondroma	1	Successful.
Osteoma	1	5th metatarsal, successful.
Keloid	1	Successful.
Nonmalignant new growth	2	Successful, 2.
Papilloma	1	Successful.
Adenoma	1	Do.
Carcinoma (squamous)	5	Successful, 5. One case was of penis, necessitating amputation; one was cancerized.
Epithelioma (of lip)	5	Successful, 5.
OPERATIONS ON CYSTS	29	
Acinous cyst	1	Excised; successful.
Sebaceous cysts	21	Excised, 20; incised and drained, 1; successful, 21.
Dermoid cyst	1	Excised; successful.
Bursal cysts	3	Incision, 2; excision, 1; successful, 1.
Retention cysts	2	Excision, 2; successful, 2.
Blood cyst	1	Incision; successful.
EVACUATION OF ABSCESES:		
By free incision and drainage	100	
Abscess of scalp	1	Successful.
Abscess of face	2	Successful, 2.
Abscess of eyelid	1	Successful.
Abscess of jaw	1	Do.
Abscess of neck	10	Successful, 10; tuberculous, 1.
Abscess of dental periosteum	5	Successful, 5.
Abscess of tonsil	2	Successful, 2.
Abscess of antrilla	3	Successful, 3.
Abscess of arm	2	Successful, 2.
Abscess of forearm	3	Successful, 3.
Abscess of hand	14	Successful, 10; unsuccessful, 4.
Abscess of palm	3	Successful, 2; still under treatment, 1.
Abscess of finger	2	Successful, 2.
Abscess of chest	1	Successful.
Abscess of back	1	Do.
Abscess of abdomen	3	Successful, 3.
Abscess, perinephritic	1	Death from tuberculosis.
Abscess of pelvis	1	Successful.
Abscess of buttock	4	Successful, 4; tuberculous, 1.
Abscess, ischio-rectal	9	Successful, 9.
Abscess of perineum	5	Successful, 5.
Abscess of penis	2	Successful, 2.
Abscess of prepuce	1	Successful.
Abscess, periurethral	1	Do.
Abscess of hip	1	Do.
Abscess of thigh	4	Successful, 4; one subsequently died of pulmonary tuberculosis.
Abscess of knee	1	Successful.
Abscess of leg	5	Successful, 5.
Abscess of heel	1	Successful.
Abscess of muscles	1	Do.
Abscess of connective tissue	9	Successful, 8; still under treatment, 1.
REMOVAL OF FOREIGN BODIES	5	
From cornea	1	Successful.
From shoulder	1	Successful, 1; gunshot wound.
From thigh	1	Death.
From leg	1	Successful; splinters.
From foot	1	Do.
OPERATIONS ON ARTERIES	2	
Ligation right common carotid	1	For aneurysm; died of suppurative meningitis 10 days after operation.
Excision of aneurysm	1	Of hand; successful.
OPERATIONS ON VEINS	15	
Obliteration of varices—Of leg	6	By subcutaneous ligature, 5; by acupuncture, 1; successful, 5.
Excision of varices—		
Of thigh	1	Successful.
Of leg	4	Successful, 4; 2 done by Schede's method.

TABLE IX.—SURGICAL OPERATIONS, FISCAL YEAR 1899—Continued.

Operations.	Number of cases.	Remarks.
OPERATIONS ON VEINS—Continued.		
Excision of varices—Continued.		
Of internal saphenous vein	1	Successful.
Of external saphenous vein	1	Do.
For nevus	2	1 by subcutaneous ligation, 1 by open ligation; successful, 1.
OPERATIONS ON THE LYMPHATIC GLANDS.		
Removal of entire gland—	225	
Glands of groin (suppurating)	112	Successful, 110. In 1, a case of Hodgkin's disease, the glands were successfully removed for examination. Patient later died of the disease. Death in 2 cases—1 from erysipelas and phlebitis, and 1 from plastic peritonitis.
Glands of neck	6	Successful, 5; 1 tuberculous, improved.
Glands of cervical region	2	Successful, 2; tuberculous, 1.
Incision and evacuation of inflamed and suppurating glands—		
Submaxillary gland	1	Successful.
Parotid gland	1	Do.
Epitrochlear gland	1	Do.
Glands of neck	3	Successful, 2; unsuccessful, 1.
Glands of cervical region	1	Successful.
Glands of pectoral region	1	Do.
Glands of axilla	3	Successful, 3.
Glands of groin	92	Successful, 88; unsuccessful and afterwards removed, 1; improved, 1; still under treatment, 1; unsuccessful, 1. In 1 case the glands were tuberculous; in 2 Helen's method was used and in 1 iodoform and vaseline was injected after the incision.
Treatment by injection—Glands of groin	2	Iodine injected, 1; iodoform injected, 1; successful, 2.
OPERATIONS ON THE SKIN AND SUBCUTANEOUS TISSUES		
Ulcer of neck	43	Curetted; successful.
Ulcer of arm	1	Dissected out; successful.
Ulcer of buttock	2	Successful, 2; both tuberculous.
Cicatrix	1	Dissected out; successful.
Skin grafting	7	5 were done for ulcer of leg; 1 for ulcer of thigh and 1 for lupus, after excision. In 6 cases Tiersch's method was followed with success in 4, partial success in 1, and with 1 entirely unsuccessful. Reverdin's method followed in 1 case, with an unsuccessful result.
Incised wound of neck	2	Sutured, 2; successful, 2.
Incision	6	For whitlow; successful, 6.
Do.	2	For ferunculosis; successful, 2.
Do.	8	For poisoned wounds; successful, 8.
On lacerated wounds—		
Of scalp	8	Successful, 8.
Of hand	2	Successful, 2.
Of foot	1	Successful.
For contused wound—Of foot	1	Do.
For hypertrophy skin of nose	1	Do.
OPERATIONS ON BONES		
Incision of periosteum	88	
Incision	3	Successful, 3; of periosteum of temporal, 1, for necrosis; of periosteum of tibia 2, for periostitis.
Osteotomy—linea	1	Successful, of tibia for necrosis.
Excision—Of metatarsal bones	2	Successful, 1; unsuccessful, 1. Both for necrosis.
Removal of fragments of bone—		
Curetting of—		
Superior maxilla	1	Necrosis; successful.
Humerus	1	Necrosis; improved.
Ulna	2	Necrosis, 2; successful, 2.
Carpus	2	Do.
Phalanges (of hand)	2	Do.
Femur	1	Necrosis, 1; improved, 1.
Tibia	5	Necrosis, 4; gunshot wound, 1; successful, 4; improved, 1.
Metatarsus	2	Necrosis, 2; improved, 1; still in hospital, 1.
Phalanges (of foot)	3	Necrosis, 3; unsuccessful, 1; successful, 2.

TABLE IX.—SURGICAL OPERATIONS, FISCAL YEAR 1899—Continued.

Operations.	Number of cases.	Remarks.
OPERATIONS ON BONES—Continued.		
Operation for ununited fracture of—		
Femur	1	Wired; unsuccessful.
Tibia and fibula	1	Wired; successful.
Operation on fractured bones (adjustment)—		
For fracture of the—		
Inferior maxilla	2	Simple; 2; successful, 2.
Nasal	1	Simple; successful.
Ribs	4	Simple; 4; successful, 4.
Scapula	2	Simple; 2; successful, 2.
Clavicle	1	Simple; successful.
Humerus	5	Simple; 4; comminuted, 1; successful, 5.
Ulna	1	Simple; successful.
Radius	3	Simple; 3; successful, 3.
Radius and ulna	3	Simple; 2; compound, 1; successful, 3.
Metacarpal	1	Simple; successful.
Phalanges	5	Simple; 2; compound, 3; successful, 5.
Femur	1	Simple; successful.
Patella	1	Wired; successful.
Tibia	3	Simple; 3; successful, 3.
Fibula	9	Simple; 9; successful, 9.
Tibia and fibula	11	Simple; 7; compound, 4; successful, 11.
Tarsus	1	Simple; successful.
Metatarsus	2	Simple; 2; successful, 2.
Phalanges	5	Simple; 5; successful, 5.
OPERATIONS ON JOINTS		
Reduction of dislocation of—	46	
Lower jaw	1	Successful.
Clavicle	1	Outer extremity; successful.
Shoulder	15	Successful, 15.
Radius	1	Lower extremity; successful.
Wrist	1	Compound; still under treatment.
Hip (old)	2	Improved, 1; successful, 1.
Tibia	1	Upper extremity; successful.
Tarsus	1	Compound; successful.
Phalanx (of toe)	1	Simple; successful.
Operations for ankylosis of—		
Shoulder	3	Successful, 2; partially successful, 1.
Elbow	1	Successful.
Wrist	10	Partially successful, 9; unsuccessful, 1.
Metacarpus	1	Unsuccessful.
Finger	1	Do.
Knee	2	Successful, 2.
Tapping or aspiration of—		
Prepatella bursa	1	Successful.
Knee	3	Successful, 2; unsuccessful, 1.
OPERATIONS ON FASCIA		
For contraction of fascia of palm	1	
	1	Cicatricial tissue removed; successful.
AMPUTATIONS		
Of forearm	53	
Of metacarpus	1	For contusions; successful.
Of thumb	1	Do.
Of phalanges (of hand)	29	For septic wound; successful.
		For septic wound, 1; for gunshot wound, 1; for contusions, 1; for frostbite and fracture, 2; for lacerated wound, 3; for gangrene, 5; for compound comminuted fracture, 5; for necrosis, 10; reamputation because of painful stump, 1; successful, 29.
Femur, upper third	1	For carcinoma; successful.
Femur, lower third	1	For necrosis; successful.
Leg (at knee)	2	For compound comminuted fracture of tibia and fibula; successful, 2.
Leg	6	For compound comminuted fracture, 2; for fracture of both bones, 2; for necrosis of bone, 1; for gangrene, 1; died, 1; successful, 5.
Foot	2	For compound comminuted fracture, 1; for contusions, 1; successful, 2.

TABLE IX.—SURGICAL OPERATIONS, FISCAL YEAR 1899—Continued.

Operations.	Number of cases.	Remarks.
AMPUTATIONS—Continued.		
Metatarsus	1	For contusions, 1; successful, 1.
Phalanges (of foot)	7	For contracted tendons, 1; for compound comminuted fracture, 1; for deformity due to arthritis deformans, 1; for gangrene, 4; successful, 7.
OPERATIONS ON THE SKULL AND BRAIN		
Trephining and removing portions of the skull	3	For depressed bone resulting from fracture, 3; died, 1 (fracture extended through base); successful, 2.
Trephining, mastoid process	4	For necrosis, 1; for inflammation mastoid cells, 3; successful, 3; improved, 1.
OPERATIONS ON THE SPINE AND SPINAL CORD		
Suspension	5	For kyphosis, 1; successful, 1.
Lumbar puncture	4	In 3 cases puncture was made between second and third lumbar vertebra and in 1 case between third and fourth lumbar vertebra. Three were done for cerebro-spinal meningitis and 1 for acute inflammation of spinal cord; successful, 3; death, 1. In the case in which death occurred the parents declined to have lumbar puncture done a second time. The first puncture relieved, temporarily, Cheyne-Stokes respiration and benefited the patient greatly.
OPERATIONS ON THE FACE, NASAL CAVITIES, AND MOUTH.		
Lacerated wound of face	1	Successful.
Nasal polypus	3	Shave; successful, 3.
Deviated septum	1	Successful.
Enlarged tonsils	3	Removed, 3; successful, 3.
OPERATIONS ON THE EYE AND ITS APPENDAGES		
Obstruction of lachrymal duct	1	Incised; successful.
Fistula of lachrymal sac	1	Successful.
Eneucleation of eyeball	1	For wound of eyeball; successful.
OPERATIONS ON LARYNX AND THYROID BODY		
Tracheotomy	2	For pressure of aneurism; death from rupture of aneurism.
Exploratory incision	1	For hypertrophied thyroid; recovery.
OPERATIONS ON THE THORAX		
Paracentesis (of pericardium)	17	Successful, 2; 1 subsequently died of enteric fever.
Paracentesis	9	Successful thoracotomy later in 1 case of empyæma; death, 1; successful, 7.
Thoracotomy	4	Successful, 4.
Excision of part of rib (seventh)	1	Still in hospital.
Irrigation of pleural cavity	1	For gunshot wound; death.
OPERATIONS ON THE ABDOMEN		
Paracentesis	78	Successful, 6; death, 4, from disease of the liver; remaining in hospital, 2; 1 patient was tapped five times and is still under treatment.
Aspiration of liver	2	Successful, 1; death, 1, from disease of liver.
Abdominal section	17	1 for intestinal obstruction—death; 1 for suspected gallstones—recovered; 1 for nonmalignant new growth—successful; 1 for abscess of liver (ameba coli found)—successful; 1 for cyst of liver—successful; 3 for typhlitis—successful, 1; death, 2; 9 for appendicitis—successful, 8; improved, 1.
Colotomy, inguinal	1	For carcinoma of rectum; death.
Strangulated hernia	1	Kocher's method; successful.
Femoral hernia	2	Reduced by taxis, 1; operation for radical cure, 1; successful, 2.

TABLE IX.—SURGICAL OPERATIONS, FISCAL YEAR 1899—Continued.

Operations.	Number of cases.	Remarks.
OPERATIONS ON THE ABDOMEN—Continued.		
Inguinal hernia.....	39	Operation for radical cure was done by Bassini's method in 32 cases; by a modified Bassini in 2; by Halstead's method in 2; by plugging the canal with the stump of ligated veins of the cord after section in operation for varicocele in 1 case; by incision and reduction in 1, and 1 case was reduced by taxis; successful, 39.
OPERATIONS ON RECTUM AND ANUS.....		
Fistula in ano.....	26	Simple dilatation, 1; incision and cauterization, 1; division and excision, 2; incision and curettage, 22; successful, 23; still under treatment, 3.
Anal fissure.....	1	Successful.
Ulcer of rectum.....	1	Do.
Stricture of rectum.....	5	Dilatation, 2; multiple incisions, 3; successful, 2; unsuccessful, 1; improved, 1; death (perforation of rectum, peritonitis), 1.
Hemorrhoids (internal).....	26	Treated by crushing, 1; by Whitehead's operation, 2; by clamp and cautery, 9; by ligation, 14.
Hemorrhoids (external).....	13	Clamp and cautery, 2; excision, 2; incision, 4; ligature, 5; still under treatment, 1; improved, 1; successful, 11.
Hemorrhoids (mixed).....	4	Clamp and cautery, 2; ligature, 2; successful, 4.
OPERATIONS ON BLADDER AND URETHRA.....		
Aspiration of bladder.....	116	2 For retention; successful, 2.
Supra-pubic cystotomy.....	1	For calculus, 1; successful, 1.
Perineal section.....	3	For urethral fistula, 3; improved, 1; still in hospital, 2.
Impacted calculus.....	1	In urethra; successful.
Urethral fistula.....	10	In 5 the edges were trimmed and sutured; external urethrotomy was done in 4; excision of sinus in 1; successful, 2; unsuccessful, 2; improved, 5; 1 left hospital against advice soon after operation.
Meatotomy.....	5	Successful, 5.
Stricture of urethra.....	94	Gradual dilatation, 49; forcible dilatation, 13; internal urethrotomy, 18; external urethrotomy, 7; internal and external urethrotomy, 1; perineal section with supra-pubic cystotomy, 2; Gouley's operation, 3; Gouley's operation, including perineal urethrotomy, 1; successful, 89; improved, 5.
OPERATIONS ON THE MALE GENERATIVE ORGANS.....		
For hypospadias.....	160	2 Plastic operations, 2; successful, 2.
For phimosis.....	106	Dorsal incision, 4; circumcision, 102; improved, 1; successful, 105.
For paraphimosis.....	5	Successful, 5.
For chancre.....	1	Circumcision; successful.
For elongated prepuce.....	1	Do.
For hypertrophy of foreskin.....	3	Circumcision, 3; successful, 3.
For ulcer of prepuce.....	1	Circumcision; successful.
For oedema of penis.....	1	Do.
For condyloma of penis.....	1	Excision and cautery; successful.
For redundant scrotum.....	1	Resected; successful.
For varicocele.....	12	Ligation and excision, 12; improved 1; successful, 11.
For hydrocele (of cord).....	1	Incised; successful.
For hydrocele.....	20	Incised, 5; tapped, 10; tapping and injection, 5; successful, 20.
For hæmatocele.....	1	Aspirated; successful.
For castration.....	4	For tuberculosis, 4; successful, 4.
OPERATIONS ON FEMALE ORGANS OF GENERATION.....		
Recto-vaginal fistula.....	1	Incised, curetted, and closed; successful.
Curettage.....	1	For endometritis; successful.

TABLE X.—RATIO OF DEATHS FROM SPECIFIC CAUSES.

Deaths from—	Per 100 from all causes.	Deaths from—	Per 100 from all causes.
General diseases	55.60	Diseases of the digestive system	7.67
Diseases of the nervous system	3.02	Diseases of the urinary system	8.37
Diseases of the circulatory system	9.07	Injuries	5.35
Diseases of the respiratory system	9.30	From all other causes	1.62

TABLE XI.—RATIO OF DEATHS IN EACH DISTRICT.

Districts.	Per 100 patients treated in hos- pital.	Districts.	Per 100 patients treated in hos- pital.
North Atlantic	3.40	The Mississippi	3.13
Middle Atlantic	3.69	The Great Lakes	3.26
South Atlantic	2.99	The Pacific	4.87
The Gulf	2.78	The quarantine stations	1.15
The Ohio	3.28		

TABLE XII.—COMPARATIVE EXHIBIT—MORTALITY PER 100 PATIENTS TREATED IN HOSPITAL, BY DISTRICTS, 1890-1899.

Districts.	General aver- age.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
North Atlantic	2.73	2.65	2.50	2.62	2.46	2.36	3.09	2.73	2.95	2.55	3.40
Middle Atlantic	3.98	4.66	3.77	3.44	3.69	4.17	4.56	4.12	3.75	3.92	3.69
South Atlantic	3.26	3.64	2.56	2.71	3.37	4.00	3.56	3.55	2.83	3.49	2.99
The Gulf	3.15	3.40	3.88	3.63	3.29	2.38	2.98	2.90	3.33	2.94	2.78
The Ohio	2.71	2.26	2.54	1.53	3.01	2.51	3.23	3.24	2.78	2.73	3.28
The Mississippi	3.26	3.04	3.67	3.37	3.64	3.99	2.53	3.20	2.92	3.18	3.13
The Great Lakes	2.78	2.63	2.44	4.11	2.76	2.61	2.54	2.26	2.86	2.34	3.26
The Pacific	4.19	4.42	4.43	3.83	3.73	3.76	4.38	4.70	4.40	3.43	4.87
The quarantine sta- tions								4.76	4.94	2.68	1.15

TABLE XIII.—COMPARATIVE EXHIBIT—RATIO OF DEATHS FROM SPECIFIC CAUSES, 1890-1899.

Deaths from—	General aver- age.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
General diseases	48.63	50.20	52.66	43.42	47.70	47.70	43.94	50.70	48.99	45.45	55.60
Diseases of the—											
Nervous system	4.87	4.06	3.69	6.05	4.81	5.58	4.81	4.65	5.56	6.56	3.02
Circulatory sys- tem	9.37	5.81	9.84	9.60	8.99	5.58	10.76	11.39	9.85	12.86	9.07
Respiratory sys- tem	13.94	19.10	15.16	15.85	13.38	16.51	16.24	12.23	10.35	11.29	9.30
Digestive system	7.56	6.30	5.33	7.30	7.11	8.48	10.53	6.51	9.09	7.35	7.67
Urinary system	5.63	4.67	4.71	4.80	6.48	5.35	6.17	3.49	7.07	5.25	8.37
Injuries	6.34	5.81	5.33	7.72	8.99	5.58	3.43	6.28	6.31	8.66	5.35
From all other causes	3.61	3.65	3.28	5.26	2.54	5.57	4.12	4.65	2.78	2.63	1.62

TABLE XIV.—COMPARATIVE EXHIBIT—AVERAGE DURATION OF TREATMENT IN HOSPITAL IN EACH DISTRICT, 1890-1899.

Districts.	General average.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
North Atlantic	29.15	29.2	29.68	24.37	24.12	26.14	29.97	31.07	26.93	33.11	36.90
Middle Atlantic	28.42	26.32	26.81	26.87	26.29	24.60	34.21	29.68	30.39	29.75	29.37
South Atlantic	27.79	28.27	26.19	26.26	29.23	29.48	29.80	26.83	26.80	29.37	25.73
The Gulf	22.05	23.21	21.07	21.97	22.33	22.13	22.46	22.24	22.41	21.35	21.41
The Ohio	23.90	24.52	24.92	23.81	23.37	22.80	25.18	25.43	22.20	23.83	23.02
The Mississippi	20.42	20.88	22.61	20.59	19.84	21.51	22.92	20.74	19.00	18.57	17.56
The Great Lakes	27.34	30.82	27.09	27.82	27.07	28.32	28.34	28.25	26.27	25.45	24.02
The Pacific	36.03	33.68	32.68	36.92	40.27	43.57	40.66	38.81	36.20	28.41	29.12
The quarantine stations	12.22						19.97	10.00	11.69	9.00	10.43

TABLE XV.—NATIVITIES OF PATIENTS TREATED IN UNITED STATES MARINE HOSPITALS DURING THE FISCAL YEAR ENDED JUNE 30, 1899.

Countries.	Number.	Countries.	Number.
Total	12,610	Iceland	9
Africa	9	India	3
Australia	27	Ireland	620
Austria	100	Italy	35
Azores	4	Japan	11
Bavaria	115	Mexico	18
Belgium	93	New Zealand	20
Brazil	50	Norway	410
Canada	250	Peru	24
Chile	75	Portugal	57
China	12	Prince Edwards Island	16
Denmark	521	Russia	109
England	345	Scandinavia	5
Finland	95	Spain	40
France	23	Sweden	420
Germany	570	Switzerland	100
Greece	8	United States of America	8,125
Holland	20	United States of Colombia	60
Hungary	18	West Indies	170
		Unknown	23

PUBLIC HEALTH SERVICE.

PUBLIC HEALTH SERVICE.

SANITARY REPORTS AND STATISTICS.

The work of the division of sanitary reports and statistics has continued as usual, in collecting from domestic and foreign sources sanitary information and preparing it for publication in the Public Health Reports. This weekly publication contains for the calendar year 1898, 1,584 pages, being larger than the one for the calendar year 1897 by 143 pages. Three thousand copies are printed, 600 being reserved for binding and distributing at the end of the year, the remainder being mailed weekly to public health officers, United States consuls, sanitarians, and others.

Reports from American consuls at foreign ports have been more regular and more numerous as the result of a circular letter sent them by the State Department at the request of the Treasury Department.

Following is a copy of the letter:

[Circular.]

WEEKLY SANITARY REPORTS.

DEPARTMENT OF STATE,
Washington, October 31, 1898.

To the Consular Officers of the United States.

GENTLEMEN: The Secretary of the Treasury, in recent correspondence, has called attention to the failure of consular officers to forward weekly sanitary reports, provided for in paragraph 375, section h, of the Consular Regulations, and has furnished a list of consulates from which these reports will be particularly valuable, which list is appended hereto. Consular officers included in this list will hereafter forward to the Secretary of the Treasury, for the Surgeon-General of the Marine Hospital Service, weekly sanitary reports on Form No. 1934b whenever the necessary data can be obtained.

The Treasury Department would also like to receive from these offices any health reports that may be published by the local authorities. It is understood that many cities make monthly publications of deaths, etc., and these are particularly desired.

Requisitions for blank forms upon which to make the weekly reports and addressed envelopes inclosing the reports should be forwarded to this Department.

In case no official data can be procured, the Treasury Department would like statements on the general health and sanitary condition of your districts.

The monthly abstract of bills of health on Form No. 25 (Consular Regulations of 1888) is no longer required, the weekly sanitary report having taken its place.

I am, gentlemen, your obedient servant,

ALVEY A. ADEE,
Second Assistant Secretary.

Owing to the acquisition of the Hawaiian Islands and Porto Rico and the occupation of Cuba by United States troops, a large number of quarantine and inspection stations have been added to the list. Reports are now received and published weekly from 20 national quarantine stations in the United States, 2 in Porto Rico, and 12 in Cuba, as well as from the most of the 28 quarantine and inspection stations in the United States under State or municipal control.

CHOLERA.

This disease has continued in the same places, except Hongkong, as were reported in the last annual report, without material increase or diminution or tendency to spread into other countries. The subjoined table shows the cities and countries from which cases have been reported as occurring from October 1, 1898, to November 1, 1899, namely, Bombay, Calcutta, Kurrachee, and Madras, India; Singapore, Straits Settlements, and in several of the kens and fus of Japan.

Cholera, as reported to the Supervising Surgeon-General United States Marine-Hospital Service, from October 1, 1898, to November 1, 1899.

Places.	Date.	Cases.	Deaths.
India:			
Bombay.....	Oct. 1-Nov. 1 .....	.....	46
Calcutta.....	do .....	.....	826
Kurrachee.....	do .....	.....	18
Madras.....	do .....	.....	118
Singapore .....	.....	.....	5
Japan:			
Fukuoka Ken.....	July 26-Aug. 20	1 .....	.....
Kanagawa Ken	do	3 .....	.....
Miye Ken.....	do	1 .....	.....
Osaka and Hiogo	June 10-Aug. 26	4	3
Tokyo Fu.....	Oct. 21-Nov. 17	2 .....	.....
	July 26-Aug. 31	31	7
	Apr. 14-Apr. 21	1	1
Yokohama	July 16-Aug. 26	3	3

YELLOW FEVER.

IN THE UNITED STATES.

SUMMER AND FALL OF 1898.

Yellow fever occurred in the United States during the summer and fall of 1898 in 24 places in Louisiana with 1,470 cases and 51 deaths; in 26 places in Mississippi with 985 cases and 63 deaths, and 1 death each in the District of Columbia, New York, and Ohio.

SUMMER AND FALL OF 1899.

SOLDIERS' HOME, NEAR HAMPTON, VA.

In July, 1899, yellow fever broke out in the Soldiers' Home near Hampton, Va. The service was called on for assistance, which was promptly rendered, and a rigid quarantine and inspection service was established with disinfection of the premises, etc., after the disease had ended—the last case occurring August 7. Total cases, 45; deaths, 13. One case only occurred outside the Home, namely in the contiguous town of Phoebus.

FLORIDA.

Key West.—September 1, 1899, yellow fever was reported in Key West, the origin not having been satisfactorily demonstrated. From August 31 to November 1, 1,291 cases with 66 deaths were reported.

Miami.—September 5 a case of yellow fever was reported in the person of a refugee from Key West. To November 1, 47 cases, with 4 deaths, were reported.

Port Tampa City.—September 10, 1 case, with death, occurred at Port Tampa City.

LOUISIANA.

New Orleans.—September 8, 1899, yellow fever was reported in New Orleans, 3 cases to that date. From that time to November 1, 73 cases with 16 deaths were reported. One of the cases included here occurred in East Baton Rouge.

MISSISSIPPI.

Yellow fever was reported as follows:

Centerville, September 29, 2 cases; Flora, October 25, number of cases not given; Jackson, September 10 to November 1, 61 cases, 9 deaths; Mississippi City, September 1 to November 1, 27 cases, 2 deaths.

Details connected with the above-named outbreaks will be found in the report of the division of domestic quarantine.

*Yellow fever in the United States as officially reported to the Surgeon-General
United States Marine-Hospital Service from July 1 to December 8, 1898.*

Places.	Date.	Cases.	Deaths.	Remarks.
District of Columbia:				
Washington	Nov. 18	1	1	
Louisiana:				
Alexandria	July 1-Oct. 15	200	2	Estimated.
Amité City	do	1	1	
Baton Rouge	do	176	4	
Baton Rouge, East	Oct. 17			Yellow fever reported.
Baton Rouge, West	do			Do.
Bowie	Oct. 6	1		
Cinclare	July 1-Oct. 15	11	1	
Delogny	do	1		
Feliciania, East	Oct. 17			Do.
Feliciania, West	do			Do.
Franklin	July 1-Oct. 20	607	9	
Harveys Canal	July 1-Oct. 6	14	3	
Houma	July 1-Oct. 15	40	2	
Iberville	Oct. 17			Do.
Jackson	July 1-Oct. 15	15	0	
Jefferson Parish	July 1-Sept. 20	5	0	
Lake Charles	July 1-Oct. 15	1	0	
Lobdell	Oct. 12			Do.
Lutcher	July 1-Oct. 15	14	2	
New Orleans	do	74	19	
Plaquemine	do	6	1	
St. Charles Parish	Oct. 4			Do.
St. James Parish	July 1-Oct. 1	1		
Wilson	July 1-Oct. 15	303	7	

*Yellow fever in the United States as officially reported to the Surgeon-General
United States Marine-Hospital Service, etc.—Continued.*

Places.	Date.	Cases.	Deaths.	Remarks.
Mississippi:				
Canton.....	July 1-Oct. 26....	9	-----	
Clinton.....	July 1-Oct. 15....	40	-----	
Crystal Springs.....	July 1-Oct. 21....	7	-----	
Edwards (vicinity).....	July 1-Oct. 16....	12	1	
Fayette.....	July 1-Oct. 13....	5	-----	
Harrison.....	July 1-Oct. 30....	134	8	
Hattiesburg.....	July 1-Oct. 21....	35	3	
Hermanville.....	July 1-Oct. 13....	3	-----	
Jackson.....	July 1-Nov. 10....	208	11	
Madison and vicinity.....	do.....	95	1	
Meridian.....	July 1-Oct. 17....	3	-----	
Natchez.....	July 1-Nov. 2....	37	4	
Orwood.....	July 1-Oct. 27....	100	5	
Oxford.....	do.....	86	12	
Poplarville.....	July 1-Oct. 18....	24	1	
Port Gibson.....	July 1-Oct. 6....	1	1	
Queen Hill.....	July 1-Oct. 15....	1	1	
Ridgeland.....	July 1-Oct. 17....	7	-----	
Starkville.....	July 1-Oct. 18....	9	-----	
Taylors.....	July 1-Oct. 21....	106	14	
Tougaloo.....	July 1-Oct. 17....	2	-----	
Waterford.....	July 1-Oct. 6....	2	-----	
Water Valley.....	July 1-Oct. 21....	12	-----	
Waveland.....	July 1-Oct. 18....	20	1	
Woodville.....	July 1-Oct. 6....	1	-----	
Yazoo City.....	July 1-Nov. 10....	26	-----	
New York:				
New York.....	Oct. 23.....	1	1	
Ohio:				
Newton Falls.....	Oct. 19.....	-----	1	

Total for Louisiana, 1,470 cases, 51 deaths. Mortality, 3.47 per cent.
Total for Mississippi, 985 cases, 63 deaths. Mortality, 6.40 per cent. Total for New York, 1 case, 1 death. Grand total for 1898, 2,456 cases, 115 deaths. Mortality, 4.68 per cent.

*Yellow fever in the United States as officially reported to the Surgeon-General
United States Marine-Hospital Service, from August 31 to November 1, 1899.*

Places.	Date.	Cases.	Deaths.
Florida:			
Key West.....	Aug. 31.....	6	-----
	Aug. 31-Sept. 4..	28	3
	Aug. 31-Sept. 5..	50	6
	Sept. 6.....	14	-----
	Aug. 31-Sept. 8..	96	8
	Sept. 9.....	31	2
	Sept. 10.....	23	1
	Sept. 11.....	12	-----
	Sept. 12.....	29	1
	Sept. 13.....	35	0
	Sept. 14.....	15	1
	Sept. 15.....	30	1
	Sept. 16.....	38	1
	Sept. 17-Sept. 18..	54	2
	Sept. 19.....	31	1
	Sept. 21.....	45	2
	Sept. 22.....	38	5
	Sept. 23.....	40	3
	Sept. 24.....	30	2
	Sept. 25.....	26	-----
	Sept. 26.....	47	2
	Sept. 27.....	26	1
	Sept. 28.....	39	1
	Sept. 29.....	54	1
	Sept. 30.....	22	2
	Oct. 1.....	48	2
	Oct. 2.....	32	1
	Oct. 3.....	(¹)	-----
	Oct. 4.....	33	-----
	Oct. 5.....	43	2
	Oct. 6.....	37	0

¹ No report.

Yellow fever in the United States as officially reported to the Surgeon-General United States Marine-Hospital Service, etc.—Continued.

Places.	Date.	Cases.	Deaths.
Florida—Continued.			
Key West	Oct. 7.....	28	0
	Oct. 8.....	24	3
	Oct. 9.....	25	0
	Oct. 10.....	13	1
	Oct. 11.....	18	—
	Oct. 12.....	7	2
	Oct. 13.....	23	—
	Oct. 14.....	10	3
	Oct. 15.....	9	—
	Oct. 16.....	15	—
	Oct. 18.....	2	—
	Oct. 19.....	7	0
	Oct. 20.....	4	0
Miami.....	Sept. 5-Sept. 22.....	2	1
	Oct. 19.....	2	1
Port Tampa City.....	Oct. 23.....	11	—
Louisiana:	Sept. 10.....	1	1
New Orleans.....	Aug. 27-Sept. 19.....	12	2
	Sept. 20.....	2	—
	Sept. 21.....	3	2
	Sept. 22.....	0	2
	Sept. 23.....	1	—
	Sept. 25.....	3	1
	Sept. 26.....	2	—
	Sept. 27.....	2	—
	Sept. 28.....	2	—
	Sept. 29.....	3	—
	Sept. 30.....	1	—
	Oct. 2-Oct. 3.....	2	—
	Oct. 4.....	5	1
	Oct. 5.....	3	—
	Oct. 7.....	1	—
	Oct. 9.....	4	—
	Oct. 10.....	2	—
	Oct. 11.....	0	1
	Oct. 12.....	0	1
	Oct. 13.....	0	1
	Oct. 14.....	2	—
	Oct. 16.....	1	—
	Oct. 17.....	0	0
	Oct. 18.....	1	—
	Oct. 19.....	1	—
	Oct. 20.....	1	(¹)
	Oct. 21.....	2	—
	Oct. 23.....	2	—
	Oct. 24.....	2	2
	Oct. 25.....	1	—
Maryland:			
Baltimore ²	Oct. 8.....	1	1
Mississippi:			
Centerville.....	Sept. 29.....	2	—
Jackson.....	Sept. 10-Oct. 2.....	12	4
Mississippi City.....	Sept. 1.....	1	1
	Sept. 14-Sept. 29.....	26	1

¹ In East Baton Rouge.

² At quarantine station.

IN FOREIGN COUNTRIES.

In foreign countries, yellow fever was reported in Buenos Ayres, Argentina; in Bahia, Ceara, Itú, Para, Rio de Janeiro, and St. Felix, Brazil; in Barranquilla, Cartagena, Colon, and Panama, United States of Colombia; in Alajuela, Heredia, Port Limon, and Punta Arenas, Costa Rica; Cienfuegos, Cristo, Daiquiri, Guantanamo, Habana, Manzanillo, Matanzas, Nuevitas, Puerto Principe, Santiago, and Sancti Spiritu, Cuba; Amealco, Chilpanzingo, Cinchapa, City of Mexico, Cordoba, Cosamaloapan, Hidalgo, Jalapa, Juchitan, Merida, Monterrey, Orizaba, Progreso, San Geronimo, San Juan la Junta, San Lo-

renzo, Tampico, Tapona, Tuxpan, Vera Cruz and Victoria, Mexico; Bluefields, Nicaragua; and San Salvador, Salvador. The table below shows the number of cases and dates of reports for the places named:

Yellow fever in foreign countries as reported to the Surgeon-General, United States Marine-Hospital Service, from October 1, 1898, to November 1, 1899.

Places.	Date.	Cases.	Deaths.	Remarks.
Argentina:				
Buenos Ayres	Apr. 1-Apr. 30.....	.....	4	
	June 1-June 30.....	.....	8	
Brazil:				
Bahia	Oct. 22-Nov. 19.....	1	1	
	Dec. 24-June 3.....	128	96	
	June 3-Aug. 12.....	177	85	
Ceara	Nov. 1-Nov. 30.....	.....	1	
Itú	Mar. 21.....	.....	.....	Yellow fever epidemic.
Para	June 1-June 30.....	.....	19	
Rio de Janeiro.....	Oct. 1-Nov. 4.....	.....	17	
	Nov. 11-May 19.....	.....	464	
	May 19-Aug. 25.....	.....	72	
St. Felix	June 7.....	.....	.....	Reported present.
Colombia:				
Barranquilla	Oct. 16-Nov. 5.....	.....	7	
	Dec. 2-Mar. 4.....	8	8	
	June 10-June 24.....	2	2	
	Aug. 6-Sept. 16.....	2	2	
Cartagena	Nov. 1-Nov. 30.....	1	1	
	May 6-May 13.....	1	1	
	Aug. 30-Sept. 9.....	2	1	
Colon	Aug. 28-Sept. 3.....	1	1	
Panama	May 28-June 13.....	22	10	
	June 16-Aug. 8.....	88	45	
	Aug. 15-Sept. 19.....	27	9	
Costa Rica:				
Alajuela	Aug. 4-Sept. 24.....	60	21	
Heredia	do.....	1	.....	
Port Limon	Aug. 18-Aug. 29.....	2	1	
Punta Arenas	Aug. 4.....	.....	.....	Yellow fever reported.
Cuba:				
Cienfuegos	July 23-July 29.....	1	1	Doubtful.
Cristo	Aug. 13-Aug. 14.....	1	.....	
Daiquiri	Aug. 27-Sept. 2.....	1	.....	
Guantanamo	Apr. 22.....	1	.....	On barkentine St. Paul
Habana	Dec. 16-June 15.....	2	10	
	June 15-Sept. 30.....	133	42	
	Oct. 1-Oct. 14.....	15	9	
Manzanillo	July 2-Oct. 7.....	11	2	
Matanzas	Mar. 16-June 20.....	3	.....	
	June 17-July 27.....	2	1	Doubtful.
	Aug. 6-Aug. 12.....	1	1	
	Oct. 3.....	1	.....	
Nuevitas	Sept. 10-Sept. 16.....	1	.....	
Puerto Principe	June 5-June 21.....	3	.....	
	To Aug. 9.....	39	13	
Santiago	June 16-June 26.....	35	11	
	June 10-Sept. 30.....	219	49	
Sancti Spiritu	Aug. 24.....	2	.....	
Mexico:				
Amealco	do.....	.....	.....	Yellow fever reported.
Chilpanzingo	Sept. 14.....	.....	.....	Yellow fever prevalent.
Cincharpa	Aug. 23.....	.....	.....	Yellow fever reported.
City of Mexico.....	Oct. 10-Oct. 16.....	.....	1	
Cordoba	June 21.....	23	14	
	May 1-Aug. 26.....	.....	133	
Cosamaloapan	Aug. 21.....	1	.....	
Hidalgo	Aug. 23.....	.....	.....	Do.
Jalapa	Aug. 9.....	.....	5	
Juchitan	Aug. 23.....	.....	.....	Yellow fever reported.
Merida	July 1.....	1	.....	
Monterey	Nov. 1.....	0	4	
	Nov. 2.....	11	8	
	Nov. 5.....	1	5	
	Nov. 6.....	0	3	
	Nov. 7.....	.....	0	
	Nov. 8.....	.....	2	
	Nov. 25-Dec. 1.....	.....	3	
Orizaba	May 1-July 24.....	.....	11	
	Aug. 29-Sept. 30.....	.....	66	
Progreso	July 25.....	2	1	
San Geronimo	Aug. 23.....	.....	.....	
San Juan la Junta	Aug. 24.....	.....	.....	Do.

Yellow fever in foreign countries as reported to the Surgeon-General, United States Marine-Hospital Service, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Mexico—Continued.				
San Lorenzo.....	Aug. 24.....	-----	-----	Yellow fever reported.
Tampico.....	Oct. 3-Oct. 23.....	-----	21	
	Nov. 1-Nov. 30.....	-----	10	
	Apr. 20-June 9.....	5	1	
	July 1-July 7.....	1	1	
	Sept. 16-Sept. 29.....	4	1	Do.
	Oct. 2.....	7	-----	
Tapona.....	Aug. 23.....	-----	-----	
Tuxpan.....	July 30-Oct. 9.....	-----	63	
Vera Cruz.....	Oct. 20-Dec. 8.....	-----	51	
	Dec. 8-June 15.....	-----	311	Do.
	June 15-Oct. 12.....	-----	231	
Victoria.....	Oct. 6.....	-----	-----	
Nicaragua:				
Bluefields.....	Sept. 23-Sept. 30.....	-----	1	
San Salvador:				Do.
San Salvador.....	June 30-Aug. 1.....	3	1	
	Sept. 1.....	-----	-----	

PLAGUE.

Plague has continued with unabated severity in the cities of Arabia, China, India, and Japan, and has shown a decided tendency to spread westward, having broken out in Alexandria, Egypt, Oporto, Portugal, and recently in the Western Hemisphere at Santos, Brazil, and probably at Asuncion, Paraguay. In the presidency of Bombay the number of cases and deaths has been appalling. Up to August 11, 1899, for the 25 districts of the presidency of Bombay, there were reported a total of 220,907 cases, and 164,083 deaths. The disease has been reported in the following cities and countries:

Arabia.—Aden, Djiddah, and Mascot.

Austria.—Vienna, where 2 deaths resulted from accidental inoculation in laboratory work.

Brazil.—Santos.

China.—Amoy, Hongkong, Fuchau, Niuchwang, and Yingkon.

Egypt.—Alexandria.

French Ivory Coast Colony.—Grand Bassam.

India.—Bombay, Calcutta, Kurrachee, and Madras.

Japan.—In a few kens but chiefly in the island of Formosa.

Lorenzo Marquez.—Magudo.

Madagascar.—Tamatave.

Mauritius.—Port Louis, and generally in the island.

Persia.—Bushire.

Portugal.—Oporto.

Russia.—Kolobovka and St. Petersburg. The disease at the latter place is reported as cattle plague, and not bubonic plague.

Straits Settlements.—Penang and Singapore.

Turkey.—Bassorah.

For number of cases and deaths see table below:

Plague as reported to the Surgeon-General United States Marine-Hospital Service from October 1, 1898, to November 1, 1899.

Place.	Date.	Cases.	Deaths.	Remarks.
Arabia:				
Aden	Apr. 7	1 .....	.....	On steamship Caledonia.
Djiddah	Feb. 22-Mar. 31 .....	.....	120	Plague reported.
Mascot	June 30 .....	.....	.....	
Austria:				
Vienna	Apr. 12	2 .....	.....	
Brazil:				
Santos	Oct. 22-Nov. 5 .....	.....	2	
China:				
Amoy	Oct. 24-Nov. 2	18	6	
Hongkong	June 16 .....	.....	.....	Do.
.....	July 1-Aug. 12 .....	.....	540	
.....	Nov. 7-Nov. 20 .....	.....	2	
.....	Dec. 10-Jan. 21 .....	.....	2	
.....	Mar. 8-May 6	142	148	
.....	Apr. 11-Aug. 19	1,555	1,495	
Fuchau	Aug. 5-Aug. 26 .....	.....	.....	Do.
Niuchwang	Aug. 18 .....	.....	.....	Do.
Yingkon	do .....	.....	.....	Do.
Egypt:				
Alexandria	May 4-Sept. 30	93	44	
French Ivory Coast	May 9 .....	.....	.....	Do.
French Ivory Coast Colony:				
Grand Bassam	June 7	200 .....	.....	
India:				
Bombay, presidency of—				
Ahmednugger district	Aug. 5-Aug. 11	45	31	Total, 1,273 cases; 956 deaths.
Aundh State	do	26	17	Total, 1,951 cases; 1,333 deaths.
Belgaum district	do	750	598	Total, 29,300 cases; 22,042 deaths.
Baroda territory	do	29	19	Total, 8,005 cases; 5,982 deaths.
Bijapore district	do	98	82	Total, 2,626 cases; 2,130 deaths.
Broach district	do	37	27	Total, 1,530 cases; 1,146 deaths.
Cutch State	do	29	27	Total, 10,477 cases; 8,634 deaths.
Dharwar district	do	143	95	Total, 38,754 cases; 31,307 deaths.
Janjira State	do .....	.....	1	Total, 413 cases; 269 deaths.
Kaira district	do	58	46	Total, 2,069 cases; 1,578 deaths.
Kanara district	do	11	11	Total, 433 cases; 311 deaths.
Khandesh district	do	1 .....	.....	Total, 1,000 cases; 810 deaths.
Kolaba district	do	15	9	Total, 2,913 cases; 2,480 deaths.
Kolhapore and Southern	do	624	500	Total, 19,185 cases; 14,408 deaths.
Mahratta country.	do .....	.....	.....	Total, 10,684 cases; 8,279 deaths.
Kurrachee district	do	1	1	Total, 6,573 cases; 5,084 deaths.
Nassik district	do	470	361	Total, 20,163 cases; 15,480 deaths.
Poona district	do	1,400	1,150	Total, 442 cases; 341 deaths.
Rewa Kantha	do	26	25	Total, 742 cases; 618 deaths.
Rutnagherry district	do	18	15	Total, 27,087 cases; 21,211 deaths.
Satara district	do	228	177	Total, 62 cases; 38 deaths.
Savanur State	do	1	1	Total, 4,912 cases; 3,960 deaths.
Sholapore district	do	29	28	Total, 7,947 cases; 5,842 deaths.
Surat district	do	61	40	Total, 12,366 cases; 9,794 deaths.
Thana district	do	108	86	Grand total, 220,907 cases; 164,083 deaths.
Bombay	Oct. 3-Oct. 25 .....	.....	499	
.....	Nov. 2-Nov. 22 .....	.....	155	
.....	Nov. 22-May 30 .....	.....	5,849	
.....	May 27-Sept. 19 .....	.....	989	
Calcutta	Jan. 21-May 13 .....	.....	1,173	
.....	May 13-Sept. 9 .....	.....	407	
Kurrachee	Apr. 8-Apr. 16 .....	.....	203	
.....	Aug. 6-Sept. 16	10	12	
Madras	Nov. 5-Nov. 18 .....	.....	4	
.....	Mar. 18-Apr. 21 .....	.....	.....	
Japan:				
Kanagawa Ken	July 1-July 10	2	1	
Nagasaki Ken	do	2 .....	.....	
Formosa: Total	Jan. 1-Apr. 23	1,629	1,195	
Taichu	Jan. 12-Apr. 22	9	1	
Taihoku	Apr. 25	2 .....	.....	
Tainan	Jan. 9-Apr. 22	574	388	
Taipeh	Apr. 22	33	22	
Taiwan	Dec. 31 .....	.....	.....	Plague exists.
.....	July 1-10	14	6	
Tamsui	Jan. 1-Apr. 26 .....	.....	1,221	
.....	Apr. 1-July 26	1,530	1,222	Total since outbreak, 2,468 cases; 1,866 deaths.

Plague as reported to the Surgeon-General, etc.—Continued.

Place.	Date.	Cases.	Deaths	Remarks.
Lorenzo Marquez:				
Magudo	Sept. 22			Plague reported.
Madagascar:				
Tamatave	Nov. 26-Feb. 8	309	210	
Mauritius	Jan. 25-May 1	4	1	
	May 4-May 31	1	5	
	July 14-July 20	30	29	
	Aug. 10-Aug. 28	68	42	
Persia:				
Bushire	June 8			Do.
	May 26-June 18		40	
Portugal:				
Lisbon	Aug. 16			Do.
Oporto	Aug. 16-Sept. 22	70	31	
Reunion (Isle de)	July 24	1	1	Do.
Russia:				
Kolobovka, Astrakhan	Aug. 1-Aug. 10		21	
St. Petersburg	July 23-July 29	1		
	Aug. 6-Aug. 12	1		
Straits Settlements:				
Penang	May 27			Plague reported.
	Jan. 4-July 21	49	39	
Singapore	May 27-June 17		3	
Turkey:				
Bassorah	June 19	1	1	

SMALLPOX.

IN THE UNITED STATES.

During the period October 1, 1898, to November 1, 1899, smallpox has been reported in 37 States, 4 Territories, the District of Columbia, and Porto Rico. It was especially prevalent in Georgia, Kentucky, Maine, Missouri, Nebraska, North Carolina, Ohio, Pennsylvania, Texas, and Virginia. The same mild character and small mortality mentioned last year continued to characterize the disease, in many cases adding to the difficulty in controlling it, because it is often supposed to be some other disease than smallpox, and the proper diagnosis is not made nor the proper restrictive measures taken until it has become widespread.

The Service has been called on to render aid to the authorities of four States in making the diagnosis in doubtful cases and in an advisory capacity as to the management of local outbreaks. Details will be found in the section relating to domestic quarantine.

Smallpox in the United States, as reported to the Supervising Surgeon-General United States Marine-Hospital Service, October 1, 1898, to November 1, 1899.

Places.	Date.	Cases.	Deaths.	Remarks.
Alabama:				
Autauga County	Feb. 24 .....	.....	.....	Smallpox reported.
Calvert	Dec. 10-Jan. 20	10 .....	.....	
Catherine	Jan. 6 .....	.....	.....	Do.
Clarke County	Dec. 25-Jan. 20 .....	.....	2	Several cases.
Clay County	Jan. 27 .....	.....	.....	Smallpox reported.
Collirene	Jan. 6	1 .....	.....	
Dallas County (near Selma)	Oct. 20	15 .....	.....	
.....	Jan. 27 .....	.....	.....	
Greene County	do .....	.....	.....	Do.
Hale County	do .....	.....	.....	Do.
Lowndes County	do .....	.....	.....	Do.
Marengo County	do .....	.....	.....	Do.
Mobile	Oct. 27	1	1	
.....	Nov. 12-Dec. 6	16	3	
.....	Jan. 2-June 3	33 .....	.....	
Montgomery County	Feb. 24 .....	.....	.....	Do.
Randolph County	Jan. 27 .....	.....	.....	Do.
Richardson	Dec. 16	52	2	
Selma	Oct. 13	1 .....	.....	
Southside	Jan. 6	96 .....	.....	
Tallapoosa County	Apr. 14 .....	.....	.....	Smallpox prevalent.
Washington County	Jan. 27 .....	.....	.....	Do.
Wilcox County	do .....	.....	.....	Do.
		225	8	
Arizona:				
Ashfork	Dec. 16	1 .....	.....	
Arkansas:				
Jefferson County	Oct. 4	20 .....	.....	Do.
Pulaski County	Jan. 27-Mar. 1	8	1	
.....	Oct. 4	6 .....	.....	
		34	1	
California:				
Los Angeles	Sept.-June 3	93	16	
Oakland	June 3-June 24	2	0	
Sacramento City	June 3	1 .....	.....	
San Diego	Feb. 19	1	1	
.....	June 1-June 30	2	1	
San Francisco	Nov. 7	1 .....	.....	
.....	Jan. 31-May 19	3 .....	.....	Soldier in army hospital.
		103	18	
Colorado:				
Arapahoe County	Nov. 25-Mar. 31	38	5	
Denver	Nov. 26	2 .....	.....	
El Paso County	Jan. 31	2 .....	.....	
Fremont County	Dec. 1-Jan. 31	24 .....	.....	
Hinsdale County	Sept. 9	1 .....	.....	
Lake County	Sept. 18	2 .....	.....	
Larimer County	Nov. 16-Nov. 26	8 .....	.....	
Las Animas County	Nov. 26	1 .....	.....	
.....	Jan. 31	12 .....	.....	
Pueblo	Sept. 9	1 .....	.....	
Pueblo County	Dec. 4-Dec. 17	12	2	
.....	Dec. 17-Jan. 31	60	4	
		163	11	
Connecticut:				
New Haven	Jan. 16	2 .....	.....	Officially reported.
Stamford	July 20	1 .....	.....	Do.
		3 .....	.....	
District of Columbia:				
Washington	Jan. 21-June 4	87	1	Do.
Florida:				
Columbia County	Mar. 1-Mar. 31	4 .....	.....	Smallpox prevalent death rate 6-7 per cent.
Gadsden County	July 1-July 31	18 .....	.....	
Hillsboro County	Apr. 10-July 10	35 .....	.....	
Jackson County	Mar. 1-Mar. 31 .....	.....	.....	
.....	July 1-July 31	1 .....	.....	
Jacksonville	July 1-Sept. 2	7 .....	.....	

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.	
Florida—Continued.					
Lake County	July 1-July 31	1		Smallpox prevalent.	
Leon County	do	4			
Marion County	Mar. 1-Mar. 31	102			
.....	July 1-July 31	3			
Pasco County	do	5			
Polk County	Mar. 1-Mar. 31				
St. John County	Feb. 1-Mar. 31	64			
Suwanee County	Mar. 1-Mar. 31	4			
Jacksonville	Feb. 12-June 10	35			
Key West	Feb. 25-Mar. 30	9			
Pensacola	Jan. 14-Mar. 31	2		In county jail.	
West Tampa, Hillsboro Co.	Apr. 9-May 20	5			
		299			
Georgia:					
Brooks County	Aug. 5-Aug. 30	2	1		
Brunswick	May 16-June 10	7			
Eastman	June 6	7			
Jones County	Jan. 1-Jan. 16	300			
Macon	June 4	2			
Montgomery County	July 15-Aug. 10	31			
Savannah	Feb. 22-June 14	44			
		7			
		410	1		
Illinois:					
Bethel	Jan. 7	2		Smallpox reported.	
Biggsville	Dec. 16	1			
Biggsville, Henderson Co.	Mar. 7	1			
Cairo	Feb. 23-Mar. 7	26			
Chicago	Mar. 10-June 25	12			
.....	June 20-July 1	3			
		45			
Indiana:					
Clark County	Mar. 1				
Dana	July 1-Sept. 30	6			
Davless County	Feb. 8	1			
Elkhart County	Mar. 1				
Evansville	July 1-Sept. 30	1			
Floyd County	Apr. 1-June 17	34			
Greene County	Jan. 1-Mar. 30	5			
Harrison County	do	6			
Jackson County	July 1-Sept. 30	1			
Jefferson County	Feb. 24	4			
Jennings County	Mar. 1				
Lagrange County	Jan. 1-Mar. 30	4			
Lake County	July 1-Sept. 30	10			
Marion County	do	1			
New Albany	Jan. 17	16			
Porter County	July 1-Sept. 30	6			
Richmond	Apr. 22	2			
Sullivan County	July 1-Sept. 30	30			
Vanderburg County	Nov. 9	1			
Vermilion County	Apr. 22	5			
.....	Jan. 1-Mar. 30	20	1		
.....	do	3			
		156	1		
Indian Territory	Mar. 4		45		
Iowa:					
Hamburg, Fremont County	Nov. 26	2		Do.	
Jones County	Apr. 13	5	1		
Lacona, Warren County	Nov. 26	2			
Lee County	Jan. 13	7	1		
Wayne County	do	1			
		17	2		
Kansas:					
Atchison County	Mar. 16	21			
Butler County	Oct. 2	5			
City of Garnett	May 6-May 13	6	1		
Emporia	May 6-May 31	10			
Hillsboro	Dec. 24	9			
Independence	Mar. 16				

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Kansas—Continued.				
Kansas City	May 6-May 20	95	11	
	June 10-June 17	2		
	Oct. 1-Oct. 8	9	1	
Lenora	May 12-June 13	12	3	
Marion County	Jan. 17	11		
Newton	Dec. 24	2	1	
Peabody	Feb. 1-Feb. 16	56	7	
Seneca	Dec. 24	1		
Sumner County	Mar. 20	2		
		241	24	
Kentucky:				
Frankfort	May 23	2		
Lebanon Junction	Apr. 19	8		
Leslie County	Aug. 17	104		
Louisville	Dec. 20-June 15	499	4	
	June 23-Sept. 23	17		
Mount Sterling	May 25	4		
		634	4	
Louisiana:				
Alexandria	Mar. 29	9		
Baton Rouge	May 27	1		
Jeanerette	June 3	1		
Morgan City	May 27	7		
New Orleans	Jan. 30-June 17	221	3	
	June 17-Aug. 26	14		
Shreveport	Apr. 22-June 3	5	1	
	Oct. 15-Oct. 21	3		
		261	4	
Maine:				
Auburn	Jan. 1-Apr. 7	3		
Augusta	do	1		
Lewiston	do	4		
Waterville	do	49		
Winslow	do	108		
		165		
Maryland:				
Baltimore	Jan. 18-June 3	21		
	June 18-July 15	18		
Cumberland	Jan. 18-June 3	3		
Pocomoke	do	3		
Steeleton	May 17	4		
	June 23	14		
		63		
Massachusetts:				
Boston	Feb. 28-June 24	13	2	
	June 27-Sept. 2	9	3	
Chelsea	June 11	3		
	Sept. 28-Oct. 12	8		
Everett	Aug. 7-Oct. 14	5	2	
Fall River	June 27-Sept. 9	2		
Lowell	Oct. 1-Oct. 7	1		
Melrose	Oct. 8-Oct. 14	1		
Roxbury	Aug. 30	3		
Swampscott	May 20-June 3	3	1	
		48	8	
Michigan:				
Albion	Feb. 15-Feb. 22			Smallpox reported.
Benton Harbor	do			Do.
Detroit	Oct. 2-Oct. 8	1	1	
	Jan. 1-Feb. 4	14		
Ecorse Township	Oct. 30-Nov. 5			
Kalamazoo	Mar. 12-Apr. 8	8	1	
Saginaw County	Sept. 10-Oct. 7			Do.
		23	2	
Minnesota:				
Albany Township	June 3	4		
Albert Lea County	Sept. 29	30		
	Sept. 30-Oct. 14	22		

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Minnesota—Continued.				
Appleton	May 27-June 16	12		
Austin	May 13	1		
	July 15-Aug. 1	1		
Brainerd	Apr. 16-Apr. 22	1		
Duluth	July 15-Aug. 1	1		
East Grand Forks	do	7		
Invers Grove Township	June 3	1		
Minneapolis	Dec. 8-June 3	5		
Round Lake	Aug. 1-Aug. 31	10		
St. Paul	Feb. 18-June 3	19		
Worthington	June 16	5	1	
		119	1	
Mississippi:				
Clay County	Jan. 27			Smallpox reported.
Hinds County	Mar. 3			Do.
Jackson County	Mar. 26-Apr. 14	6		
Jones County	Jan. 27			Do.
Lauderdale County	do			Do.
Natchez	July 7-Oct. 12	15		
Noxubee County	do			Do.
Perry County	Jan. 27-Mar. 12	17	3	
Pine Ridge	Aug. 16	8		
Tishomingo County	Jan. 27			Do.
		46	3	
Missouri:				
Barry County	Apr. 6-July 20	35		
Carroll County	Nov. 1-Apr. 6	59	15	
Charlton	do	1		
Dekalb County	do	3		
Farmington	June 19	1		Do.
Lawrence County	Apr. 6-Apr. 30	1		
Lincoln County	do	9		
Macon County	Aug. 19	1		
Mississippi County	do	1		
St. Francois County	Apr. 6-July 30	30	2	
St. Joseph	Oct. 20-Apr. 29	56	1	
St. Louis	Nov. 1-June 19	115	5	
	June 19-June 26	4		
Scott County	Apr. 6-July 20	25		
Stoddard County	do	35		
		375	23	
Montana:				
Butte	Sept. 30-Oct. 18	2	1	
Great Falls	Sept. 18	6		
Missoula	Feb. 23-Mar. 9	2		Do.
		10	1	
Nebraska:				
Nebraska City	July 1-Dec. 8	153		
	Dec. 9-Jan. 16	147	3	
Omaha	Jan. 1-June 17	40		
Otoe and Nemaha counties.	Jan. 1-Jan. 16	21		
Peru	Jan. 2	5		
Plattsmouth	Dec. 10	1		
Tecumseh	Jan. 2	9		
		376	3	
New Jersey:				
Bloomfield Township, Essex County.	June 5	1		
Jersey City	Dec. 5-Jan. 22	6		
Ocean Township, Monmouth County.	June 13	24		
Ocean Township, Ocean County.	June 14	1		
		32		
New Mexico:				
Deming and vicinity	Dec. 11	25		
Las Vegas and vicinity	Dec. 9			Smallpox epidemic.
		25		

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
New York:				
Batavia	Apr. 1-Apr. 30.	1	—	
Buffalo	Mar. 15-Apr. 26	3	—	
Caledonia	Apr. 1-Apr. 30.	1	—	
Coeymans	do	2	—	
Deposit	Nov. 1-Nov. 30	1	—	
Dunkirk	Jan. 8-Jan. 21	5	—	
Elmira	Mar. 18-Apr. 22	2	—	
Kingston	Mar.	1	—	
New York City	Dec. 24	1	—	
	Jan. 7-June 24	0	16	
	Oct. 15-Oct. 21	3	—	
Rochester	Apr. 1-Apr. 30	—	1	
Syracuse	do	1	—	
Tonawanda	March	2	—	
		23	17	
North Carolina:				
Alamance County	Feb. 1-Feb. 28	3	—	
Anson County	Apr. 1-Apr. 30	2	—	
Beaufort County (Washington).	Apr. 8	2	—	
Bertie County	Feb. 1-Apr. 30	9	—	
	May 1-May 31	4	—	
	July 1-July 31	1	—	
Burke County	do	22	—	
Burlington, Alamance Co.	Mar. 1	3	1	
Caldwell County	July 1-July 31	3	—	
Caswell County	do	6	—	
Catawba County	do	1	—	
Charlotte	June 30	1	—	
Chatham County	Apr. 1-Apr. 30	2	—	
Chowan County	Feb. 16-Apr. 30	17	—	
	May 1-May 31	1	—	
Columbus County	Feb. 1-Feb. 28	3	—	
Craven County	Apr. 6	1	—	
Currituck County	Feb. 1-Apr. 30	3	—	
	do	6	—	
	July 1-July 31	2	—	
Edgecombe County	Nov. 12	10	—	
	Feb. 1	24	—	
Elizabeth City	Dec. 19	1	—	
Elmwood	Nov. 12	2	—	
Forsyth County	do	2	—	
Gates County	Feb. 1	—	—	Several.
	May 1-May 31	—	—	Do.
	July 1-July 31	12	—	
Halifax County	Feb. 1-Feb. 28	8	—	
	do	7	—	
Hertford County	Apr. 1-Apr. 30	2	—	
	May 1-May 31	4	—	
	July 1-July 31	2	—	
Iredell County	do	1	—	
Johnston County	Feb. 1-Feb. 28	1	—	
McDowell County	Feb. 1-Feb. 25	2	—	
	May 1-May 31	1	—	
Martin County	Apr. 1-Apr. 30	3	—	
Mecklenburg County	Apr. 1-Apr. 30	2	—	
Moore County	do	4	—	
	May 1-May 31	1	—	
Nash County	Apr. 1-Apr. 30	7	—	
	May 1-May 31	—	—	Do.
Northampton County	Jan. 12-Feb. 28	6	—	
	do	1	—	
Pasquotank County	Feb. 1-Feb. 25	15	—	
Perquimans County	do	1	—	
Richmond County	July 1-July 31	1	—	
Rockingham	May 1-May 31	14	—	
Rowan	do	1	—	
	July 1-July 31	1	—	
Union County	Apr. 1-Apr. 30	8	—	
Wake County	Apr. 30	43	—	
	May 1-May 31	4	—	
Wayne County	do	7	—	
Wilmington	Dec. 24	1	—	
	Feb. 3	1	—	
Wilson County	Feb. 1-Feb. 28	1	—	
		293	1	

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Ohio:				
Avon.....	Apr. 6-May 16.....	2	—	
Bainbridge Township, Geauga County.....	Jan. 1-Apr. 16.....	1	—	
Bethlehem Township.....	Apr. 3-May 16.....	2	—	
Brooklyn.....	Feb. 7-Feb. 27.....	1	—	
Camden.....	Apr. 6-May 16.....	1	—	
Cannelsville.....	Jan. 1-Apr. 6.....	1	1	
Carthage.....	Apr. 6-May 16.....	1	—	
Chagrin Falls.....	.....	3	—	
Cincinnati.....	Oct. 8.....	3	—	
	Jan. 23-May 5.....	338	10	
	July 7-Oct. 14.....	22	—	
Cleveland.....	Nov. 14.....	1	—	
	Dec. 25-June 17.....	215	3	
	June 24-Oct. 21.....	23	—	
Cleves.....	Jan. 1-Apr. 6.....	7	—	
Clinton Township.....	Apr. 6-May 16.....	6	—	
Collinwood.....	do.....	1	—	
Columbus.....	Feb. 7-June 23.....	202	4	
	July 30-Aug. 5.....	1	—	
Coshocton.....	Jan. 1-May 16.....	7	—	
Dayton.....	Oct. 8.....	1	—	
	July 15-Oct. 7.....	6	—	
Dialton.....	Feb. 7-Apr. 6.....	1	—	
Donnelsville.....	.....	1	—	
Euclid Township.....	Apr. 6-May 16.....	2	—	
Franklin.....	Apr. 6.....	5	—	
Fredericksburg.....	Jan. 1-May 16.....	17	—	
Gallipolis.....	Apr. 6.....	3	—	
Girls' Industrial Home.....	Jan. 1-May 16.....	3	—	
Granville.....	do.....	1	—	
Green Township, Gallia County.....	Apr. 6-May 16.....	7	—	
Harrison Township, Perry County.....	Jan. 1-May 16.....	2	—	
Howard.....	do.....	2	—	
Ironton.....	Apr. 6-May 16.....	1	1	
Kellys Island.....	do.....	1	—	
Killbuck.....	do.....	1	1	
Lafayette Township, Coshocton County.....	Jan. 1-May 16.....	8	—	
Lancaster.....	Apr. 6-May 16.....	1	—	
Lockland.....	Jan. 1-May 16.....	7	—	
Lorain.....	do.....	1	—	
Madisonville.....	Apr. 6-May 16.....	2	—	
Margaretta Township.....	do.....	2	—	
Massillon.....	May 27-June 17.....	2	—	
Middlefield.....	Jan. 1-Apr. 6.....	1	—	
Mill Creek Township.....	Apr. 6-May 16.....	14	—	
Millersburg.....	do.....	7	1	
Newburg Township.....	Apr. 6-May 16.....	1	—	
New Carlisle.....	do.....	4	—	
New Paris.....	Oct. 8.....	1	—	
Newton Township, Muskingum County.....	Jan. 1-May 16.....	21	1	
Oberlin.....	do.....	1	—	
Painesville.....	do.....	1	—	
Parma Township, Cuyahoga County.....	do.....	1	—	
Pike Township, Madison County.....	Apr. 6-May 16.....	2	—	
Plain City.....	Jan. 1-May 16.....	1	—	
Pleasantville.....	do.....	1	—	
Ridgeville Township, Lorain County.....	Apr. 6-May 16.....	2	—	
Ripley.....	Jan. 1-May 16.....	4	—	
Roseville.....	do.....	1	—	
Rudnor Township, Delaware County.....	Apr. 6-May 16.....	1	—	
Sand Hill.....	Jan. 1-May 16.....	8	—	
St. Marys.....	Oct. 8.....	2	—	
Sandusky.....	do.....	1	—	
	Feb. 7-May 16.....	43	—	
Selma.....	Jan. 1-Apr. 6.....	1	—	
Shenandoah.....	Feb. 7-Apr. 6.....	1	—	
South Charleston.....	do.....	2	—	
Springfield.....	do.....	1	—	
Springfield Township, Clark County.....	Jan. 1-May 16.....	22	—	
St. Johns.....	Jan. 1-Apr. 6.....	2	—	
Sunbury.....	Apr. 6.....	4	—	
Thorn Township, Perry County.....	Apr. 6-May 16.....	1	—	

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Ohio—Continued.				
Tippecanoe	Jan. 1-Apr. 6	1	.....	
Toledo	Feb. 7-May 16	6	.....	
Uniopolis	Oct. 8	1	.....	
Union Township, Brown County	Apr. 6-May 16	1	.....	
Wapakoneta	Oct. 8	20	.....	
Washington Township, Clermont County	Apr. 6-May 16	7	.....	
Wellington	Feb. 7-May 16	1	.....	
West Farmington	Jan. 1-Apr. 6	1	.....	
West Jefferson	Jan. 1-May 16	6	.....	
Willoughby	Feb. 7-Apr. 6	1	.....	
Xenia	Jan. 1-Apr. 6	3	.....	
Zanesville	do	1	.....	
		1,016	22	
Oklahoma:				
Chandler	Dec. 30	1	.....	
Doggett	do	1	.....	
Lincoln County	Nov. 30-Jan. 30	32	10	
Oklahoma City	June 1	1	.....	
Parkland	Dec. 30	1	.....	
Sac and Fox Agency	do	2	.....	
Stroud	Dec. 17	5	1	
	Dec. 30 .....	.....	3	
		43	14	
Oregon:				
Astoria	Oct. 11	1	.....	
Portland	June 13	1	.....	
	June 13-July 19	6	.....	
Umatilla County	Sept. 7 .....	.....	.....	
		8	.....	
Pennsylvania:				
Allegheny County	Feb. 11-June 3	27	.....	
	June 3-Sept. 30	38	.....	
Ball Hill	Dec. 31-Jan. 23	1	.....	
Beaver County	Mar. 12-Mar. 30	1	.....	
Bedford and Bedford Co.	Dec. 20	34	.....	
	Dec. 31-June 3	34	.....	
Belle Vernon	June 3-June 26	1	.....	
Blair County	Jan. 1-June 3	39	.....	
Brownsville Township	do	34	.....	
Brumbaugh	Dec. 31-Mar. 30	2	.....	
Cambria County	Mar. 30-Apr. 22	13	.....	
	June 3-Aug. 5	27	.....	
Center County	Apr. 27-June 3	1	.....	
Charlesville	Dec. 31	15	.....	
Chester County (near Spring City)	Oct. 7-Oct. 29	10	1	Smallpox reported.
	Apr. 27-June 3	1	.....	
Claysburg	Dec. 31-Jan. 23	1	.....	
Columbia County	Apr. 27-June 3	1	.....	
East Vincent Township	Dec. 31	1	.....	
Erie	May 2	1	.....	
Everett	Dec. 31	3	.....	
Fayette County	Mar. 12-June 3	83	.....	
Fulton County	Dec. 21	8	.....	
	Feb. 11-Mar. 11	1	.....	
Homer City	Dec. 31	2	.....	
Hopewell	do	3	.....	
Huntingdon County	Dec. 20 .....	.....	.....	Do.
	Feb. 11-June 3	7	.....	
Hustontown	Dec. 31	4	.....	
Jefferson County	Apr. 27-June 3	5	.....	
Johnstown	do	13	.....	
New Granada	Dec. 31	7	.....	
Philadelphia	Dec. 31-June 24	111	16	
Pittsburg	Dec. 31-June 17	12	.....	
Pottstown	Feb. 5-Feb. 11	1	.....	
Sayre, Bradford County	Oct. 7-Nov. 28	5	.....	
Somerset County	Feb. 11-June 3	250	.....	
	June 3-Aug. 5	10	.....	
Steelton	Dec. 31-June 3	12	.....	
Washington County	Mar. 30-June 3	17	1	
	June 3-June 26	11	.....	At Penn Station, several.
Waterfall	do	1	.....	
Westmoreland County	June 3-Aug. 5	2	.....	
		850	18	

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Porto Rico:				
Ponce	Jan. 17-June 10 ..	503	26	
	June 17-July 22 ..	6		
San Juan	Mar. 6	3		
		512	26	
Rhode Island:				
Providence	Feb. 21-June 3 ..	6		
South Carolina:				
Aiken County	Apr. 16	3		
Barnwell County	May 16	3		
Beaufort County	Apr. 16-May 16 ..	5		
Clarendon County	do	4		
Edgefield County	Jan. 1-May 16 ..	105	10	
Greenville	June 17	1		
Horry County	Mar. 1-Mar. 31 ..	18		
Swinton County	Apr. 16	2		
		141	10	
Tennessee:				
Dyersburg	Mar. 24	3		
Grover, Madison County	Feb. 18-Mar. 11 ..	12		
Hardeman County	Mar. 1-Mar. 11 ..	1		
Jackson	Feb. 18-Mar. 27 ..	52		
Memphis	Dec. 20	1		
	Feb. 18-Mar. 27 ..	36		
	Sept. 23-Oct. 9 ..	4		
Nashville	Apr. 29-June 3 ..	3		
Pinson, Madison County	do	1		
Union City, Obion County	Mar. 3-Mar. 11 ..	7		
		120		
Texas:				
Alice, Nueces County	Feb. 20	20		Many cases reported.
Beaumont	Aug. 2	8		
Brazos County	Aug. 4-Aug. 18 ..			
Brenham, Washington Co.	do	1		
Brownsville	Jan. 7-Apr. 8 ..	3		
Bryan	Jan. 29-Mar. 11 ..	24		
Candelaria	Sept. 29	1		
Canaigre	do	1		
Dallas	Feb. 1-Mar. 28 ..	52	15	
	Aug. 4-Aug. 18 ..	1		
Del Rio, Kinney County	Apr. 15	1		
El Indie	Sept. 29	7		
El Paso	Aug. 1-Dec. 31 ..	45		Year 1898.
	Jan. 1-Jan. 18 ..	21		
Fort Bliss	Mar. 12	1		
Galveston	Mar. 14-May 13 ..	36		
	Oct. 20	1		
Laredo	Dec. 1-Dec. 7 ..	5	1	
	Jan. 1-Apr. 29 ..	685	126	
Presidio	July 28	40		
Palno	Sept. 29	2		
Pilares	do	15		
Ruidoso	do	4		
Sabine Pass	July 15	2		
San Antonio	May 1-May 31 ..	9	1	
	Aug. 1-Aug. 31 ..	1	1	
San Rafael	Jan. 29	4		
Shafter	July 28-Aug. 5 ..	25		
Sixteen places	Aug. 5-Sept. 9 ..	79	4	
Taylor	Aug. 4-Aug. 18 ..	1		
Zapata County	Mar. 13	2		
		1,067	148	
Virginia:				
Alexandria	Jan. 4-May 14 ..	304	2	
	Oct. 20	1		
Cape Charles	July 8	1		
Danville	June 14-July 6 ..	30		
Hampton	Feb. 15	6		
Lynchburg	Mar. 5-Mar. 11 ..	1	1	
Newport News	Dec. 31-June 24 ..	683	14	
Norfolk	Sept. 19-June 22 ..	822	14	
	June 22-Aug. 4 ..	19	1	
Petersburg	Dec. 12-Dec. 18 ..	1		
	Mar. 6-Mar. 12 ..	1		

Smallpox in the United States, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Virginia—Continued.				
Portsmouth	Dec. 31-June 22	344	5	
Richmond	June 22-Oct. 14	16		
Augusta County	Jan. 25-Mar. 12	8		
Brunswick County	July 1-July 31	1		
Charles City County	do	2		
Gloucester County	Aug. 1-Aug. 31	8		
Goochland County	July 1-July 31			Smallpox reported.
Greensville County	do			Do.
Hanover County	do			Do.
Isle of Wight County	Aug. 1-Aug. 31	1		
Mathews County	do	6		Do.
Mecklenburg County	do	3		
Norfolk County	do			Do.
Orange County	do	2		Do.
Pittsylvania County	do			Smallpox prevalent.
Princess Anne County	July 1-July 31	2		
Prince George County	Aug. 1-Aug. 31	1		
Scott County	July 1-July 31			Several cases.
Surry County	Aug. 1-Aug. 31	9		
Sussex County	do	14		
Wise County	do	2		
		2,288	37	
Washington:				
Almira	July 3	9		
Orcas Island	Oct. 20	5		
Seattle	May 30	1		
	July 19-Sept. 30	6		
Spokane	Feb. 27-June 17	17		
	July 8-Aug. 19	7		
	do	7		
Tacoma	July 23-Aug. 5	2		
Walla Walla	June 29	8		
		62		
West Virginia:				
Benwood	July 5	1		
Elkhorn, McDowell County	Aug. 19	1		
		2		
Wisconsin:				
Calumet County	Feb. 16	1		
Harrison County	Feb. 20	1		
Milwaukee County	Apr. 24-June 17	13	2	
Outagamie County	Feb. 7-Mar. 20	15	2	
Wausau	Oct. 12	1		
		31	4	
Wyoming:				
Cheyenne	Mar. 5-Mar. 26	5		
Rock Springs	Dec. 24	1		
		6		
Total		10,453	458	

IN FOREIGN COUNTRIES.

Smallpox has been reported as present in 115 cities and places in 36 foreign countries. In fact, it may be said to have occurred in about every large city in the world. It was especially prevalent in Brazil, in Bahia and Rio de Janeiro; in Greece, in Athens; in Mexico, in many cities and towns; in Japan, in the island of Formosa; and in Russia, in Moscow, Odessa, and St. Petersburg. No cases were reported in Berlin and very few in the German Empire.

A table is annexed giving the number of cases for each place and country:

Smallpox in foreign countries as reported to the Surgeon-General United States Marine-Hospital Service from October 1, 1898, to November 1, 1899.

Places.	Date.	Cases.	Deaths.	Remarks.
Africa:				
Lourenço Marquez.....	Oct. 1-Oct. 30.....	.....	21	
Sierra Leone.....	May 4.....	38		
	Dec. 1-Dec. 24.....	18		
Arabia:				
Aden.....	May 1-May 31.....	.....	1	
Haneguine.....	May 2.....	.....		Smallpox epidemic.
Argentina:				
Buenos Ayres.....	Nov. 1-Nov. 30.....	.....	5	
	Apr. 1-July 31.....	.....	5	
Austria:				
Budapest.....	June 16-June 24.....	2		
	July 31-Aug. 6.....	1		
Prague.....	Apr. 29-May 6.....	6		
	Aug. 27-Sept. 30.....	12		
Belgium:				
Antwerp.....	Oct. 1-Oct. 29.....	11	6	
	Oct. 30-Dec. 3.....	25	17	
	Dec. 3-June 3.....	75	29	
	June 10-Sept. 30.....	25	10	
Ghent.....	Mar. 25-Apr. 8.....	.....	1	
	June 23-July 1.....	.....	1	
Brazil:				
Bahia.....	Oct. 2-Nov. 19.....	228	32	
	Nov. 19-May 20.....	175	15	
	June 3-Sept. 16.....	5		
Rio de Janeiro.....	Oct. 1-Nov. 4.....	65	24	
	Nov. 11-May 19.....	232	136	
	May 19-Aug. 25.....	554	316	
Canada:				
Ontario—				
Coburg County.....	Jan. 30-Feb. 22.....	1		
Dundas County.....	do.....	1	1	
Dunham County.....	do.....	1		
Essex County.....	do.....	1		
Grenorth County.....	do.....	5	1	
Kent County.....	do.....	3		
Northumberland County.....	do.....	1		
Prescott County.....	do.....	15	3	
Stormont County.....	do.....	11	1	
York County.....	do.....	3		
Province of Quebec.....	Jan. 26-Apr. 21.....	14	1	
Canary Islands:				
Santa Cruz de Tenerife....	Sept. 17-Sept. 23.....	.....	2	
China:				
Fuchau.....	Feb. 25.....	.....		Smallpox prevalent.
	Sept. 16.....	.....		Smallpox reported always prevalent.
Hongkong.....	Jan. 1-Apr. 15.....	34	21	
Colombia:				
Barranquilla.....	Mar. 25-Apr. 15.....	8		
Panama.....	July 26-Aug. 1.....	1	1	
Cuba:				
Casilda.....	Aug. 1-Aug. 31.....	.....	1	
Dos Caminos.....	May 13.....	1		
Habana.....	Dec. 30.....	1		In United States army.
	Apr. 14-Apr. 20.....	.....	1	
	June 30-July 6.....	5	1	
Nuevitas.....	June 17.....	.....		Smallpox reported.
Sancti Spiritu.....	June 7.....	.....		Reported present.
Santiago.....	Feb. 23-Mar. 21.....	2		On steamship Thomas Brooks.
	Apr. 8-Apr. 15.....	4		
	July 1-July 8.....	1		
Ecuador:				
Guayaquil.....	Nov. 5-Nov. 19.....	.....	2	
Egypt:				
Alexandria.....	Aug. 20-Aug. 26.....	.....	1	
Cairo.....	Jan. 16-May 26.....	.....	15	
	May 20-Aug. 19.....	.....	28	
England:				
Liverpool.....	Dec. 3-June 3.....	8	1	
	June 10-June 17.....	.....	1	
London.....	Oct. 8-Oct. 15.....	.....	1	
	Dec. 17-June 10.....	18	4	
	June 10-Aug. 5.....	5	1	

Smallpox in foreign countries, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
England—Continued.				
South Shields	Jan. 21-Jan. 28	1	.....	
Sunderland	Jan. 15-Jan. 21	2	.....	
France:				
Nantes	June 1-June 30	1	.....	
Marseille	June 25-July 2	1	.....	
	Oct. 19-Oct. 26 .....	.....	1	
Paris	Dec. 24-Feb. 11 .....	.....	3	
	July 2-July 8 .....	.....	1	
Germany:				
Breslau	Apr. 26 .....	.....	.....	Smallpox reported.
Donstedt	May 9 .....	.....	.....	Do.
Dusseldorf	Sept. 3-Sept. 9 .....	.....	1	
Hamburg	Apr. 8-May 6	5	.....	
Gibraltar	Jan. 30-Feb. 12	2	1	
	June 4-June 21	1	.....	
Greece:				
Athens	Mar. 11-June 10	475	123	
	June 10-Sept. 30	150	34	
India:				
Bombay	Oct. 3-Oct. 11 .....	.....	1	
	Nov. 22-May 30 .....	.....	89	
	May 27-Sept. 19 .....	.....	116	
Calcutta	Nov. 19-May 13 .....	.....	22	
	May 13-June 10 .....	.....	2	
Ceylon—				
Colombo	Dec. 24-Dec. 31 .....	.....	1	
Madras	Nov. 26-May 19 .....	.....	12	
	May 20-Sept. 15 .....	.....	11	
Straits Settlements:				
Singapore	Dec. 1-Jan. 31 .....	.....	22	
Italy:				
Milan	Jan. 22-Jan. 28	1	.....	
Rome	Oct. 1-Oct. 8 .....	.....	1	
	Nov. 5-Nov. 12 .....	.....	1	
Japan:				
Awomori Ken	Nov. 18-Dec. 31	126	28	
Chiba Ken	Dec. 9-Dec. 31	1	.....	
Fukuoka Ken	Oct. 21-Nov. 17	1	.....	
Hiogo Ken	Nov. 18-Dec. 8	1	.....	
Ishikawa Ken	Oct. 21-Nov. 17	1	.....	
Iwate Ken	Dec. 9-Dec. 31	1	.....	
Kanagawa Ken	Nov. 18-Dec. 8	1	.....	
Miyagi Ken	Oct. 21-Nov. 17	6	.....	
Nagano Ken	Dec. 9-Dec. 31	1	.....	
Nagasaki Ken	Apr. 1-May 10	7	1	
Osaka and Hiogo	Mar. 4-Apr. 22	3	.....	
Saitama Ken	Dec. 17-Dec. 27	1	.....	
Tamsui, Formosa	Apr. 1-June 30	210	.....	
The Hokkaido	Nov. 18-Dec. 8	8	.....	
Tottori Ken	do	3	.....	
Korea:				
Seoul	Jan. 1-Mar. 25 .....	.....	.....	Smallpox endemic.
Madagascar:				
Tamatave	Jan. 18-Jan. 25	8	.....	
Tananarivo	Nov. 26-Jan. 18	123	6	
Mexico:				
Chihuahua	Jan. 7-June 10 .....	.....	21	
	July 16-Oct. 7 .....	.....	29	
City of Mexico	Dec. 31-June 4	57	54	
	June 4-Oct. 7	105	72	
Ciudad Porfirio Diaz	Jan. 10	10	.....	Do.
	Feb. 11-Feb. 25 .....	.....	.....	
Cuchio	Sept. 29	25	.....	
Fuente	Apr. 11	2	.....	
Guerrero	Mar. 13-May 31	5	.....	
Juarez	Feb. 18	15	.....	
Monterey	Dec. 2-Jan. 5 .....	.....	3	
Muletto	do	12	.....	
Nuevo Laredo	Jan. 29-June 3	11	8	
	July 1-Aug. 26 .....	.....	3	
Ojenega	Sept. 29	50	.....	
Pilares	do	15	.....	
Progreso	Oct. 7	30	.....	
Saltillo	Dec. 2 .....	.....	.....	Present but not epidemic.
San Antonio	Sept. 29	20	.....	
San Felipe	Oct. 7	100	.....	
San Francisco	Sept. 29	5	.....	
San Juan	do	100	.....	
Suarez	Oct. 7	40	.....	
Torreón	June 7 .....	.....	.....	Smallpox epidemic.
Vado de Piedras	Sept. 29	20	.....	
Vera Cruz	Jan. 5-Apr. 27 .....	.....	6	

Smallpox in foreign countries, etc.—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Netherlands:				
Amsterdam	Dec. 12-Dec. 24 ..	1	—	
Rotterdam	Dec. 12-Dec. 31 ..	3	1	
	May 27-June 1 ..	1	—	
	July 15-July 22 ..	1	—	
Nicaragua:				
Bluefields	Apr. 18-May 6 ..	2	—	
Russia:				
Khabarovsk	Apr. 1-Apr. 30 ..	1	—	
Moscow	Oct. 3-Oct. 29 ..	37	15	
	Oct. 30-Nov. 26 ..	28	8	
	Dec. 24-May 27 ..	226	73	
	May 27-Sept. 30 ..	117	56	
Odessa	Jan. 7-June 10 ..	83	20	
	June 10-Sept. 30 ..	43	13	
Riga	June 1-June 30 ..	22	7	
St. Petersburg	Oct. 8-Dec. 3 ..	25	7	
	Jan. 1-June 3 ..	196	17	
	June 3-Sept. 30 ..	101	33	
Warsaw	Oct. 30-Nov. 26 ..	—	16	
	Jan. 16-May 27 ..	—	30	
	June 3-Sept. 23 ..	—	19	
Scotland:				
Glasgow	Dec. 5-Dec. 25 ..	3	1	
	June 3-June 17 ..	1	1	
Spain:				
Barcelona	Aug. 1-Aug. 31 ..	—	15	
Madrid	Dec. 22-Dec. 28 ..	—	1	
Valencia	Aug. 16-Sept. 15 ..	5	1	
Straits Settlements:				
Singapore	June 1-June 30 ..	—	3	
	Apr. 1-Sept. 9 ..	—	35	
Turkey:				
Bagdad	Oct. 22-Nov. 27 ..	96	20	
Beirut	Apr. 26-May 13 ..	3	—	
	June 27-July 1 ..	1	—	
Constantinople	Jan. 2-June 7 ..	—	157	
Erzerum	July 8-Sept. 23 ..	17	1	
Rhodes	Apr. 17 ..	1	—	
Smyrna	Dec. 25-May 21 ..	—	3	
Uruguay:				
Montevideo	Oct. 8-Oct. 15 ..	2	—	
	Mar. 1-Apr. 29 ..	8	1	
	May 27-Aug. 20 ..	—	10	
Wales:				
Cardiff	Dec. 18-Dec. 24 ..	1	—	

CEREBRO-SPINAL MENINGITIS.

INVESTIGATION WITH REGARD TO THE PREVALENCE OF CEREBRO-SPINAL MENINGITIS.

In order to obtain the number of cases and deaths, and the States and localities in which they occurred, the following circular letter was issued.

[Cerebro-spinal meningitis—Circular letter addressed to medical officers, acting assistant surgeons, and sanitary inspectors of the Marine-Hospital Service, and secretaries State boards of health.]

WASHINGTON, D. C., *March 16, 1899*

SIR: You are requested to report as soon as practicable—

1. Whether cerebro-spinal meningitis or spotted fever has appeared in your State since October 1, 1898, giving the localities.
2. The number of cases and deaths which have occurred to date of your report.
3. The result of any investigations which may have been made as to the etiology and pathology of the disease.

The information received from yourself and others will be published in the Public Health Reports, United States Marine-Hospital Service.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General. U. S. M. H. S.

From the replies it will be seen that the disease was present in 30 States and the District of Columbia, the majority of the cases and deaths occurring in Massachusetts, New York, Pennsylvania, Kentucky, the District of Columbia, Indiana, Missouri, and Minnesota, showing that it was not limited to any particular section of the United States. It was impossible to get the correct number of cases, but the mortality was high, being estimated at from 75 to 90 per cent.

ABSTRACT OF REPLIES RECEIVED.

ALABAMA.

Mobile.—Two deaths from cerebro-spinal meningitis have been reported to the health officer during the past week. There are no other cases known.

Two deaths have been reported during the week ended April 9.

ARKANSAS.

Cerebro-spinal meningitis has appeared very generally throughout the State of Arkansas since October 1, 1898, most notably in the counties of Jefferson, Pulaski, Conway, Crawford, and Sebastian. Deaths have been reported mostly in the valleys of the Arkansas and White rivers. The number of cases in any locality in the State can not be stated, there being no State or local law or regulation requiring cases of the disease to be reported. In the city of Little Rock 57 deaths have been reported as having been caused by cerebro-spinal fever, meningitis, spinal fever, and brain fever from December 21, 1898, to April 1, 1899. A number of deaths have also been reported as caused by congestion of the brain during the same period.

The deaths in Little Rock by months were, December, 1898, 1; January, 1899, 11; February, 1899, 19; March, 1899, 26. The mortality has been extremely high wherever the disease has prevailed. No particular investigations have been made as to its etiology and pathology.

The disease is now decreasing in the localities where it first appeared and is just beginning to be noticed in other localities, particularly in northern Arkansas, where it has not prevailed to any alarming extent until recently.

Newport.—Cerebro-spinal meningitis has been prevalent in many localities of the State during the past sixty days. There have been a number of cases at Black Rock, Walnut Ridge, Bald Knob, Augusta, and Newport. No reliable information as to the number of cases and deaths can be given for any locality except Newport, but most of the cases are known to have been fatal. In Newport during the past three weeks there have been 12 cases, all of which have terminated fatally. No investigations as to the etiology and pathology of the disease are known to have been made.

CALIFORNIA.

Cases and deaths of cerebro-spinal meningitis are reported as follows since October 1, 1898: Bakersfield, 6 cases, 6 deaths; Cedarville, 3 cases, 1 death; Chico, 3 cases, 3 deaths; Colton, 1 case; Merced, 1 case, 1 death; Napa, 1 case, 1 death;

Oakland, 2 cases, 1 death; Redding, 2 cases, 2 deaths; San Diego, 2 cases, 2 deaths; Santa Maria, 2 cases.

Eureka.—No cases of cerebro-spinal meningitis or spotted fever have occurred at this port or in the northern portion of the State so far as known. Some sporadic cases have been reported in the middle and southern portions of the State. No investigations are known to have been made in regard to the etiology of the disease.

Los Angeles.—Two deaths were reported from cerebro-spinal meningitis during June, 1899.

San Diego.—One death from cerebro-spinal meningitis was reported during the month of June.

Table of cases and deaths of cerebro-spinal meningitis in California from October 1, 1898, to April 22, 1899.

Name of town.	Name of county when included.	Number of cases.	Number of deaths.	Origin.	Etiology.	Pathology.	Result of any investigation.
Biggs.....	Biggs	1	1	.....	(1)	(1)	(2)
Dagget.....	Dagget	0	0	.....	.....	.....	.....
Elsinore	Riverside	0	0	.....	.....	.....	.....
Eureka	Eureka	0	0	.....	.....	.....	.....
Kelseyville	Lake	0	0	.....	.....	.....	.....
San Jose	San Jose	0	0	.....	.....	.....	.....
San Rafael	Marin	0	0	.....	.....	.....	.....
Santa Barbara	Santa Barbara	0	0	.....	.....	.....	.....
Sacramento	Sacramento	8	.....	.....	.....	.....	.....
Woodland	Yolo	3	3	(3)	.....	.....	.....

¹ None given.

² No investigation.

³ Sporadic.

CONNECTICUT.

New Haven.—From October 1, 1898, to March 1, 1899, 20 fatal cases have been reported to the board of health by the town clerks, who are the registrars of their respective towns. Of these 9 are certified as cerebro-spinal meningitis. The others are classified meningitis, spinal meningitis, cerebral meningitis, or as secondary to some other disease.

Danbury.—An outbreak of cerebro-spinal meningitis was reported April 20, with 6 cases and 3 deaths.

DELAWARE.

Wilmington.—No case reported to the State board of health.

DISTRICT OF COLUMBIA.

Washington.—During the week ended June 3, 1899, 5 deaths from cerebro-spinal meningitis were reported. The total number of deaths reported from October 1, 1898, is 84. Five deaths were reported from cerebro-spinal meningitis during the week ended June 20. Health Officer Woodward reports 2 deaths from cerebro-spinal meningitis during the week ended July 1.

FLORIDA.

Monticello.—One case was reported January 25, 1899. Every precautionary measure was adopted, and there has been no spread of the disease. A few widely separated sporadic cases, mild in type, have been reported throughout the State during the past six months.

GEORGIA.

South Atlantic Quarantine Station.—No cases of the disease in this locality.

ILLINOIS.

Cairo.—During the winter of 1898-99, and up to date, 6 cases and 5 deaths have been reported. There have been no investigations as to the causes or pathology of the disease. There are no cases at present known to the health officer.

Chicago.—From October 1, 1898, to March 27, 1899, 21 certificates were returned to the office of the health commissioner giving cerebro-spinal meningitis as the cause of death. The records of Cook County Hospital show that 36 cases were treated there, of which 26 were fatal. The physicians in South Chicago report 21 cases and 5 deaths. The only investigation into the etiology and pathology of the disease known to have been made is reported in a paper prepared by the medical inspector of the Chicago health department, which is now being published in the Journal of the American Medical Association.

Chicago (correction).—In the public health reports of April 14, 1899, No. 15, 36 cases of cerebro-spinal meningitis, with 26 deaths, were reported as having been treated from October 1, 1898, to March 27, 1899, at Cook County Hospital. The statement should read, "treated in 31 hospitals, including Cook County Hospital." Three cases were reported as treated in Cook County Hospital during the period named.

INDIANA.

The following table includes the reports made to the State board of health:

Cerebro-spinal meningitis in Indiana for period commencing November 1, 1898, to April 1, 1899.

Counties.	Cases.	Deaths.	Sex.		Age (years).							
			Male.	Female.	Under 1.	1 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.
Allen	1	1	1	—	—	—	—	1	—	—	—	—
Clark	2	2	2	—	—	—	—	2	—	—	—	—
Crawford	9	3	6	3	3	3	2	1	—	—	—	—
Floyd	3	1	3	—	—	—	—	2	—	1	—	—
Harrison	4	4	3	1	1	2	—	—	—	1	—	—
Perry	—	—	—	—	—	—	—	—	—	—	—	—
Posey	12	7	10	2	1	1	2	6	1	—	1	—
Spencer	1	1	—	—	—	—	—	—	—	—	—	—
Switzerland	1	1	1	—	1	—	—	—	—	—	—	—
Vanderburg	75	41	36	39	8	19	15	20	6	4	3	—
Vermilion	3	3	1	2	1	2	—	—	—	—	—	—
Warrick	5	4	2	3	—	—	2	1	1	—	—	1
Total	116	68	66	50	13	27	23	33	8	6	4	1

NOTE.—No etiological or pathological investigations have been made.

IOWA.

Des Moines.—The only cases reported have been from Chariton, Lucas County. Of these, 1 was fatal. The disease has been unofficially reported as present at Dubuque. No investigation as to the etiology and pathology of the disease is known to have been made.

Dubuque.—One death reported since January 1, 1899. A fatal case of cerebro-spinal meningitis was reported May 12.

KENTUCKY.

Louisville.—Complete statistics are not obtainable, as returns of this disease are not made to the State board of health. The press reports cases and deaths at

Louisville, and at Henderson and Elizabethtown. In Louisville the deaths have amounted to about 4 a week.

Elizabethtown.—Cerebro-spinal meningitis is reported as having again developed.

LOUISIANA.

Shreveport.—Cases of cerebro-spinal meningitis are not reported. The first death from this disease was observed during the week ended October 22, 1898; the second during the week ended November 19. The third was reported in the last week in January, 1899. During the month of February 8 deaths were reported. From March 4 to March 25, 7 deaths were reported. No investigations as to the etiology or pathology of the disease are known to have been made. During the week ended April 1, 3 deaths from cerebro-spinal meningitis were reported. During the week ended April 8, 1 death from cerebro-spinal meningitis was reported, making 20 deaths since the last week in January, 1899. One death from cerebro-spinal meningitis was reported during the week ended April 22, 1899. During the two weeks ended May 7, 1899, 6 deaths from cerebro-spinal meningitis were reported. Since January 31, 26 deaths have resulted from cerebro-spinal meningitis. Acting Asst. Surg. Booth reports 2 deaths for the week ended June 10, and a total of 29 deaths since January 1, 1899. One death from cerebro-spinal meningitis was reported for the week ended June 24. Total since last of January, 1899, 30 deaths.

MAINE.

Portland.—No patient has been treated for cerebro-spinal meningitis at the Marine Hospital in this city since October 1, 1898.

Sanford.—One case was reported on February 20. It is likely there has been a much larger number of cases.

Augusta.—No information on the subject can be furnished, owing to the fact that no reports have been received by the State board of health.

MARYLAND.

Anne Arundel County.—One case since October, 1898.

Baltimore.—(1) No cases have been reported here since October 1, 1898. Two cases occurred in Dorchester County in July, 1898, and 1 case in Howard County about a month later. (2) Unknown. (3) *Diplococcus intracellularis* has been demonstrated in 3 out of 5 cases examined by the health department of Baltimore. During the week ended April 22, 1899, 2 cases and 6 deaths of cerebro-spinal meningitis were reported.

Berlin, Worcester County.—One fatal case.

Cambridge, Dorchester County.—One case.

Crisfield.—No cases known to exist.

Solomons.—No cases have appeared in this locality during the period named.

MASSACHUSETTS.

Gloucester.—There were 3 cases and 2 deaths during November, 1898.

Deaths from cerebro-spinal meningitis.—(*Massachusetts, October 1, 1898, to March 30, 1899.*)

Cities.	For the week ended—														
	October—				November—				December—						
	8	15	22	29	5	12	19	26	3	10	17	24	31		
Boston	1	2				1	1	1	1			3	3		
Worcester	2	2		2	1		2	1	1			3			
Cambridge			1												
Lowell									1						
Lynn		2	1			1					1	1	1		
New Bedford							1				1				
Somerville	1	1	1		1			1		1		1			
Lawrence								2							
Springfield												1			
Holyoke			2		1					1					
Brockton															
Malden							1			1					
Chelsea							1					1			
Haverhill	1														
Gloucester					1				1						
Newton			1												
Everett															
Quincy															
Waltham															
Woburn									1						
Hyde Park															
Peabody															
Amesbury															
Total	5	7	6	2	3	3	7	3	5	3	2	10	4		
Grand total by months	20				16				24						

Cities.	For the week ended—											
	January—				February—				March—			
	7	14	21	28	4	11	18	25	4	11	18	
Boston			2	1	2	1	1	2	2	4	2	
Worcester	1	1		2	1	2	1	1	3	1	3	
Cambridge		1										
Lowell		1								1		
Lynn		1	2				1					
New Bedford							1					
Somerville				1	1			1		2		
Lawrence												
Springfield	1	1										
Holyoke	2				3	2	2		1	2	1	
Brockton			2									
Malden												
Chelsea							1	1	1			
Haverhill												
Gloucester	2	1		1		1		1	1			
Newton	1	1										
Everett										1		
Quincy										1		
Waltham	1											
Woburn												
Hyde Park		1										
Peabody	1											
Amesbury					4							
Total	9	8	8	5	10	6	7	6	10	10	6	
Grand total by months	30				29				26			

MICHIGAN.

Houghton County.—The county clerk reports 5 localities infected, with 32 deaths from the disease. The number of cases is not known. The date of the first case was January 11, 1899.

Lansing.—Cerebro-spinal meningitis has been reported present in 22 localities in the State of Michigan, with 30 cases and 25 deaths. Of these cases the diagnosis was disputed in one, and doubtful in one.

Ludington.—One fatal case supervening on influenza.

Manistee.—During the period named 14 cases and 6 deaths have been reported within a radius of 14 miles of Manistee. No cause for the disease can be discovered other than that it followed the influenza which has been prevalent during the winter. No pathologic investigations have been made.

MINNESOTA.

Duluth.—No epidemic of cerebro-spinal meningitis exists in this city. A few sporadic cases have occurred, but no more than usual. The inclosed report, received from the State board of health, shows the number of deaths from cerebro-spinal meningitis throughout the State and the localities where they occurred.

Places.	1898.			1899.		Total.
	Oct.	Nov.	Dec.	Jan.	Feb.	
Cloquet				1		1
Crookston		1			1	2
Duluth	1		3	2	2	8
Elmore					1	1
Fairmont		1	3	3	3	10
Fountain Township			1			1
Lynden Township			1			1
Minneapolis			1	5	8	20
New Ulm			1			1
St. Paul	2				7	9
Shakopee		1				1
South St. Paul		1				1
Stillwater				2		2
Waseca				1		1
Total	3	4	16	14	22	59

MISSISSIPPI.

Jackson.—Cases and deaths since October 1, 1898, numerous, but number not stated.

Vicksburg.—No cases of primary cerebro-spinal meningitis, but many cases of influenza, with cerebro-spinal meningitis as the distinguishing feature of the disease. Influenza was less diffused among the population during the last epidemic than in former epidemics, but the rate of mortality was unusually high.

MISSOURI.

St. Louis.—Cases and deaths of cerebro-spinal meningitis have been reported as follows to the health commissioner: October, 1898, 1 case, 1 death; November, 1 case, no death; December, 1 case, 1 death; January, 1899, 13 cases, 9 deaths; February, 38 cases, 19 deaths. Twenty-five deaths were reported during month of June as caused by cerebro-spinal fever.

NEW HAMPSHIRE.

Portsmouth.—One fatal case of cerebro-spinal meningitis has been reported in this city since October 1, 1898. This case was reported from Fort Constitution,

Newcastle, N. H. No other case has occurred and no special precautions have been taken.

NEW JERSEY.

Trenton.—Since October 1, 1898, cases have been reported as follows: Camden County, 20; Gloucester County, 1.

NEW YORK.

The following report was furnished by the State board of health, on request, to Passed Assistant Surgeon Stoner, and by him transmitted to the Marine-Hospital Bureau:

From October, 1898, to February, 1899, inclusive, there were reported to this office deaths from cerebro-spinal meningitis from the following localities and in the following numbers:

New York City, 109; Yonkers, 4; Albany, 7; Cohoes, 3; Watervliet, 1; Troy, 3; North Greenbush, Rensselaer County, 1; Berlin, 1; Rensselaer, 1; Hudson, 1; Newburg, 1; Rosendale, 1; Woodstock, 1; Middletown, 1; Ogdensburg, 1; Canton, 2; Belmont, Franklin County, 1; Queensbury, Warren County, 1; Schuyler Falls, Clinton County, 1; Watertown, 1; Schenectady, 1; Rome, 2; Amsterdam, 2; Johnstown, 1; Gloversville, 1; Rotterdam, 1; Binghamton, 1; Elmira, 1; Hornellsville, 1; Howard, Steuben County, 1; Hume, Allegany County, 1; Chautauqua, 1; Buffalo, 14; Rochester, 2; Lockport, 1; Walworth, Wayne County, 1; Avon, Livingston County, 1; Porter, Niagara County, 1.

In all, forty localities have returned deaths from this cause, all but seven of them returning but a single death during the period. The disease has not prevailed epidemically, nor has an epidemic occurred in the State in a long time.

It is no doubt endemic in some localities. New York City during the past year has had an increased prevalence.

No reports of cases of this disease are required by the State board and none are received.

No doubt allowance must be made for indefinite use of the name as a cause of death.

Buffalo.—Three deaths from cerebro-spinal meningitis were reported during the month of June.

NORTH CAROLINA.

Raleigh.—Four cases and 3 deaths were reported from Ashe County in December, 1898, and 1 case and 1 death from McDowell County in February, 1899.

NORTH DAKOTA.

Edinburg.—No cerebro-spinal meningitis reported in the State since October 1, 1898.

OHIO.

Cincinnati.—There have been a few sporadic cases in this city and locality. The number can not be ascertained, but 11 deaths have been reported since October 1, 1898. Cultures made from 2 cases in the city demonstrated the presence of only the staphylococcus pyogenes aureus and albus. Two deaths were reported from cerebro-spinal meningitis during the week ended June 16. For the week ended June 30 there were 3 deaths reported from cerebro-spinal meningitis, and 3 deaths also for the week ended July 7.

Toledo.—Cerebro-spinal meningitis is not under supervision of the local board of health. Deaths from this disease have been reported as follows: October, 1898, 1 death; November, 1898, 1 death; December, 1898, 1 death; January, 1899, 1 death; February, 1 death; March, 1 death; total, 6 deaths since October 1, 1898.

OREGON.

Astoria.—No appearance of cerebro-spinal meningitis known to have occurred since October 1, 1898.

Marshfield.—No cases of cerebro-spinal meningitis known to have occurred since October 1, 1898.

Portland.—No well-authenticated case has been reported during the last eight months. No bacteriological examinations have been made.

PENNSYLVANIA.

The secretary of the State board of health reports as follows: Ephrata, March 4 to April 8, 2 cases, 1 death; Lancaster, March 15 to April 8, 38 cases, 20 deaths; Philadelphia, March 4 to April 8, 104 cases, 55 deaths.

Philadelphia.—During the week ended May 27, 2 deaths were reported. Ten cases and 9 deaths from cerebro-spinal meningitis were reported during the period from June 3 to June 26, 1899. During the week ended July 1, 1 case and 1 death were reported. Four cases of cerebro-spinal meningitis and 3 deaths were reported for the week ended July 8. For the week ended July 15 there were reported 1 case and 2 deaths from cerebro-spinal meningitis.

RHODE ISLAND.

Providence.—There have been 11 deaths from cerebro-spinal meningitis in this State since October 1, 1898. viz. at Cranston, 1; East Providence, 1; Hopkinton, 1; Lincoln, 1; Newport, 2; Pawtucket, 2; Warwick, 2; and Woonsocket, 1. As the disease has not assumed an epidemic form, no investigation as to etiology has been made.

SOUTH CAROLINA.

Charleston.—One case was reported during the month of March, 1899. This is the only case known to have occurred in this city since October 1, 1898. Since April 29, 1899, 3 deaths from cerebro-spinal meningitis are reported.

Georgetown.—The disease has not been known to exist in this section for many years.

TEXAS.

Galveston.—No deaths from cerebro-spinal meningitis have been reported since October 1, 1898, but several physicians of standing are convinced that they have had cases. During the week ended April 8, 3 deaths from cerebro-spinal meningitis were reported. Three deaths from cerebro-spinal meningitis were reported during the week ended April 22.

Paris.—Seven new cases of meningitis were reported on April 14.

VIRGINIA.

Alexandria.—From October 1, 1898, to May 20, 1899, 20 cases and 10 deaths have been reported. During the week ended May 27, 1 death from cerebro-spinal meningitis was reported.

Richmond.—No appearance of cerebro-spinal meningitis in this locality during the period referred to. During the year 1898, 197 cases were reported throughout the State, exclusive of the cities of Norfolk, Petersburg, Richmond, Roanoke, and Lynchburg.

WASHINGTON.

Port Townsend.—No cases have been reported since October 1, 1898.

Seattle.—No cases reported since October, 1898.

Spokane.—Three deaths from cerebro-spinal meningitis are reported, 1 occurring in December and 2 in March. Three cases and 2 deaths are reported under date of April 17. A few cases have been observed in the Puget Sound district. The diplococcus intracellularis meningitis has been found during the past year in the nasal secretion of 4 cases and in the pus obtained at necropsies in 2 fatal cases.

Tacoma.—Since October 1, 1898, 7 deaths from cerebro-spinal meningitis have been reported.

WISCONSIN.

La Crosse.—No case known to exist in the State.

Summary of mortality, by States, October 1, 1898, to July 15, 1899.

Cerebro-spinal meningitis was reported in 30 States and the District of Columbia as follows:

State.	Places.	Deaths.	State.	Places.	Deaths.
Alabama	1	4	Mississippi	1	(¹)
Arkansas	10	69	Missouri	1	55
California	14	24	New Hampshire	1	1
Connecticut	2	23	New Jersey	2	-----
District of Columbia	1	91	New York	40	178
Florida	1	1	North Carolina	2	4
Illinois	2	36	Ohio	2	25
Indiana (Nov. 1 to Apr. 1)	11	68	Pennsylvania	3	93
Iowa	2	3	Rhode Island	8	11
Kentucky	3	128	South Carolina	1	3
Louisiana	1	32	Texas	2	9
Maine	1	-----	Virginia	1	11
Maryland	5	7	Washington	2	12
Massachusetts	23	145	Wisconsin	1	10
Michigan	28	63			
Minnesota	14	59	Total	186	1,060

¹ Numerous.

EPIDEMIC DYSENTERY IN JAPAN.

The reports of the sanitary inspector of the Service stationed in Yokohama, Japan, show an alarming prevalence of dysentery in that country with an exceedingly high rate of mortality. Throughout the Empire in 1897 there were reported 89,846 cases with 22,520 deaths, a mortality of 25 per cent. In 1898 there were reported for the year 90,335 cases and 22,199 deaths, a mortality of 24.5 per cent. In 1899 for the first half of the year no statistics were received, but from July 1 to September 25 there were reported 66,674 cases and 13,436 deaths, a mortality of 21 per cent. Sanitary Inspector Eldridge reports under date of October 21, 1899, that the epidemic of dysentery bids fair this year to exceed in magnitude any which has occurred for five years past. No reports have so far been received as to the etiology and pathology of the disease, although the type of the disease is of sufficient severity to demand a thorough investigation into its nature in order intelligently to treat it and end its ravages. Such an investigation will doubtless be conducted by the Japanese authorities and be reported by the sanitary officer of the Service stationed at Yokohama.

Epidemic of dysentery in the Japanese Empire from July 1 to September 25, 1899.

Locality.	July 1 to 10.		July 11 to 25.		July 26 to Aug. 20.		Aug. 21 to 31.		Sept. 1 to 25.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Kioto Fu	18	3	50	7	291	49	198	49	275	61
Osaka Fu	33	3	47	8	188	31	72	8	126	20
Tokyo Fu	119	19	299	54	620	143	276	93	326	101
Aichi Ken	204	32	223	29	242	49	80	11	164	32
Akita Ken	2	1	13	1	14	1	16	1	262	48
Awomori Ken	2	1	13	15	107	9	67	7	2,690	290
Chiba Ken	161	37	243	53	348	94	186	51	230	76
Fukui Ken	11	2	159	11	374	123	65	37	111	53
Fukuoka Ken	106	8	223	19	150	23	53	9	62	12
Fukushima Ken	259	122	735	78	2,153	346	1,310	189	2,537	488
Gifu Ken	58	5	202	32	419	98	196	67	253	79
Grimma Ken	400	81	546	123	885	201	338	78	287	93
Hioo Ken	53	6	121	21	342	80	194	47	275	70
Hiroshima Ken	7	1	65	14	230	52	100	34	179	57
Ibaraki Ken	39	6	430	84	570	155	146	46	270	79
Ishikawa Ken	1	1	32	7	361	58	173	48	335	100
Iwate Ken	22	6	21	4	579	89	1,145	204	4,788	840
Kagawa Ken	16	5	28	3	228	41	134	42	177	53
Kagoshima Ken	57	6	196	26	241	40	166	32	316	44
Kanagawa Ken	308	49	279	93	706	167	370	112	443	132
Kochi Ken	127	20	81	9	117	28	72	20	207	43
Kumamoto Ken	7	1	197	34	433	77	166	31	161	32
Miyagi Ken	39	4	22	9	192	32	346	48	1,272	245
Miyazaki Ken	14	1	56	8	205	24	69	10	154	12
Miye Ken	107	11	43	8	100	32	40	14	63	22
Nagano Ken	59	14	527	68	1,529	350	796	177	1,241	299
Nagasaki Ken	8	1	100	22	200	37	65	21	79	21
Nara Ken	75	14	27	3	44	16	11	4	16	5
Niigata Ken	10	1	707	88	3,519	650	1,813	413	4,356	976
Oita Ken	2	1	95	25	202	41	110	22	89	27
Okayama Ken	2	1	101	14	493	142	180	63	171	65
Okinawa Ken	2	1	2	1	36	5	35	7	35	5
Saga Ken	285	44	6	1	77	12	35	8	32	13
Saitama Ken	324	36	372	75	610	186	213	75	199	97
Shidzuoka Ken	4	2	396	87	568	131	294	64	351	99
Shiga Ken	2	1	16	2	74	20	39	13	61	17
Shimane Ken	4	1	48	9	148	21	122	20	117	22
Tochigi Ken	38	4	158	18	408	67	224	51	279	58
Tokushima Ken	3	1	18	1	173	34	98	30	155	58
Tottori Ken	2	1	16	3	80	20	55	21	30	24
Toyama Ken	23	5	44	10	80	32	85	31	152	65
Wakayama Ken	9	1	83	12	104	19	41	11	26	4
Yamagata Ken	13	1	39	6	126	19	195	27	397	54
Yamanashi Ken	314	44	53	3	144	25	103	29	120	22
Yehime Ken	32	3	582	97	840	193	421	99	548	151
The Hokkaido	3	1	92	12	145	34	65	14	102	19
.....	3	1	1	1	6	1	2	1	12	5
Total	3,287	487	7,773	1,298	19,701	3,995	10,990	2,486	24,923	5,170

Grand total, 66,674 cases; 13,436 deaths.

LEPROSY.

In order to ascertain approximately the extent to which leprosy exists, especially in this hemisphere, the following letter was addressed to the Secretary of State.

TREASURY DEPARTMENT,

Washington, December 22, 1898.

SIR: I have respectfully to request that the United States consuls in South America, Colombia especially, be called upon for report as to prevalence of leprosy in their respective districts, giving the total number, as nearly as can be approximated—in short, everything relating to the leper population of those countries—for the information of this Department. Similar information from Cuba,

Porto Rico, and the Philippine Islands is also desired, if practicable to obtain the same.

Respectfully, yours,

O. L. SPAULDING,
Acting Secretary.

The SECRETARY OF STATE.

In response to the above the following circular was sent by the State Department to the United States consuls and consular officers in Central and South America:

INQUIRY REGARDING LEPROSY.

DEPARTMENT OF STATE,
Washington, January 10, 1899.

To the Consular Officers of the United States in South America.

GENTLEMEN: The following letter from the Treasury Department, of the 23d ultimo, is communicated to you for your consideration. You will please prepare the desired reports.

"I have respectfully to request that the United States consuls in South America, Colombia especially, be called upon for report as to prevalence of leprosy in their respective districts, giving the total number as nearly as can be approximated—in short, everything relating to the leper population of those countries—for the information of this Department."

I am, gentlemen, your obedient servant,

THOS. W. CRIDLER,
Third Assistant Secretary.

The replies received are annexed with a table of the number of cases as furnished by these reports and from other sources.

ARGENTINE REPUBLIC.

CONSULATE OF THE UNITED STATES,
Buenos Ayres, February 10, 1899.

SIR: I have the honor to acknowledge the receipt of circular dated January 10, 1899, regarding "leprosy." In answer thereto I have the pleasure to report that the disease is not in existence in this Republic.

I have the honor to be, sir, very respectfully,

D. MAYER, *Consul.*

The ASSISTANT SECRETARY OF STATE,
Washington, D. C.

LEPROSY IN BAHIA, BRAZIL.

[From the United States consul.]

Since the early history of Bahia there has always been more or less leprosy present and provision has always been made for such cases as were indigent. In 1787 Roderigo José de Mendezes inaugurated the Hospital dos Lazaros, which was designed especially for the lodging and treating therein of such lepers of either sex, whatever nationality, religion, or condition of life, as might seek admittance thereto.

This hospital is still in existence and is situated on the edge of the city of Bahia in the region designated as "Baixa das Quintas." It consists of two wings, St. Christopher for men and Sta. Anna for women, the wings being separated by the chapel where divine services are held. At present it is provided with accommodation for about 25 cases and the buildings have an area of about 60 meters.

It is under the management of a very rich Roman Catholic benevolent society called "Santa Casa de Misericordia da Bahia." To this society the State has turned over the management of all hospitals, cemeteries, asylums, and other public charities.

The hospital is sustained in part by the State, which appropriated Rs. 13,000.000 (\$1,950) in 1899, and Rs. 20,000.000 (\$3,250) in 1899. I can not ascertain how much the society contributes, as the society makes no detailed report of the institutions under its care.

At the hospital is a doctor and two servants. I understand that no attempt is being made to treat leprosy itself, nor can I find that any time is being spent in systematic study of the disease, the need for the doctor being to administer to such other ailments as may arise. In fact, the hospital serves just as a retreat for such cases as have not a more desirable place to stay.

It is impossible to give any idea of the extent of leprosy in the State of Bahia, as there are no statistics on the subject; however, I am sure that it is quite widely distributed through the State, though the greatest number of cases undoubtedly exist in Bahia city. I have examined cases in several of the smaller towns of the interior and there is always quite a number of known cases in this city; but even here it is impossible to state the actual number of cases in existence, as there is a record only of such cases as enter the hospital, and many cases never enter the hospital at all, while some enter and stay for a short time and, leaving, there is no record kept as to where they have gone.

I have been informed that a few years ago there was a law requiring segregation and isolation of cases, but that it was not strictly enforced, other than that those once admitted to the hospital were never allowed to leave it. The law has since been repealed and since then there has been no attempt made at segregation, isolation, or quarantine during any time in the progress of the disease; in fact, I have seen cases which were far advanced upon the street corner asking alms, and one in the earlier stages of the disease every day sits on the sidewalk of the main thoroughfare to the business section of the city asking alms of all who pass him. I also know of cases which are cared for in private residences by relatives or friends and, in some instances, under the most unhygienic surroundings.

The following table compiled from the report of the bureau of hygiene contains all the statistics which it is possible to obtain and refers only to the cases in the Hospital dos Lazaros:

Year.	Cases.		Deaths.	
	Male.	Female.	Male.	Female.
1896	19	—	11	—
1897	15	6	3	2
1898	15	5	1	2

¹ Sex not given.

Of the cases given all are Brazilian born with the exception of one woman given as a case and death in the year of 1897.

LEPROSY IN PERNAMBUCO, BRAZIL.

CONSULATE OF THE UNITED STATES,

Pernambuco, April 18, 1899.

SIR: Replying to Department's circular, dated January 10, 1899, "Inquiry regarding leprosy," I beg to inclose herewith copy and translation of letter received from Dr. Pontual, one of the most eminent physicians in this city. Informa-

tion of this character is most difficult to obtain, though I am satisfied that care for this great scourge is exercised in a very loose manner. I have had my attention called to a leper at large on one of the principal bridges of this city soliciting and receiving alms.

Another was pointed out on the Rue do Commercio, the principal business street, and yet, again, a third in a café situated on the before-mentioned street.

I am, sir, your obedient servant,

BENJ. F. CLARK, *United States Consul.*

THE ASSISTANT SECRETARY OF STATE,

Washington, D. C.

[Inclosure—Translation.]

Hon. Mr. CLARK, *American Consul:*

Having inquired of my colleagues residing here regarding leprosy, and having endeavored to find out how many sick there are in the leper hospital, I have arrived at the following result: Leprosy is not a common and frequent disease in Pernambuco. At present the leper hospital possesses 62 sick.

I am, with all consideration, etc.,

CONSTANCIO PONTUAL.

DECEMBER 4, 1899.

LEPROSY IN RIO DE JANEIRO, BRAZIL.

[From W. Havelburg, M. D., sanitary inspector, Marine-Hospital Service.]

Leprosy, as a chronic infectious disease, deserves great consideration in Brazil. Probably that disease was imported to Brazil between 1644-1697 by the Portuguese. In proof of this supposition I will point to the communications of the physician and scientific traveler, Piso, who accompanied the celebrated explorer of Brazil, Count John Maurice, of Nassau, during the years 1637-1644. That scientist writes in his work, published at Leyden, 1658: "*Lepra autem et scabies incognitæ sunt,*" and in another place: "*Inter vitia cutanea nondum ulli medicorum, ex quo detecta fuit hæc America pars, scabiem, lepram, elephantiasim observasse configit, sicut in Ægypto aliisque fervidiorebus regionibus grassare testatum est ab antoribus.*"

On the other hand, in the year of 1697 there were already so many lepers in Brazil that the governor, Arthur de Sá Menezes, asked the King, D. Pedro II, of Portugal, for a special and separate place in which the lepers might be treated.

In the interval between 1644 and 1697 nothing noteworthy occurred in Brazil except the increasing immigration of the Portuguese, in whose country and in whose colonies leprosy had spread very much at that time, as is well known. Also at the present time there are still a great many lepers in the Portuguese possessions, and chiefly at Madeira.

No legal regulations intended to restrict the prevalence of leprosy have been issued; therefore, in Brazil during the last two centuries leprosy has largely spread. The scientific traveler, Tschudi, writing, about 1850, states that on the frontier, between the provinces of Minas and Sao Paulo, there are localities in which almost every family is "*morfetico*;" and in his report of the year 1840 to the provincial chamber of Sao Paulo the president states:

"It is pitiable to see the number of wretched people infected with leprosy ranged along the road from Rio de Janeiro to Sao Paulo. In the vicinity of every village there is a hut which serves as a refuge for these exiles from society."

The situation has been much changed by natural causes and by the efforts made

in their own behalf by the people; but leprosy still persists in a greater or less degree in all the States of Brazil. For the most part the lepers are poor people, or they gradually become so, and then they wander helplessly in the streets as beggars, or otherwise they are a burden to their families and neighbors; but also in the better and best situated circles of society there are lepers. An estimate of 3,000 lepers in Brazil at the present time can not be considered exaggerated.

For these unfortunates there are some special sanatoriums, so-called "leproseries," at Pernambuco, Sao Paulo, and principally at Rio de Janeiro. The leprosy hospital at the last-named place was originally founded as a monastery of the Jesuits, but it has been renovated and altered so often that it may be considered as almost a new establishment. The administration of the hospital is in charge of a religious association of the Irmandade do Santissimo Sacramento de Candelaria.

There are no regulations imposing on lepers the obligation to enter the hospital and there is also no domiciliary inspection of the lepers by the authorities, and no obligatory notification by physicians. No special notice has been taken of the resolutions of the International Leprosy Conference of last year, at Berlin, for converting theories into practical measures.

As for the rest, it is probably very difficult to subject the lepers to legal regulations, requiring isolation, inspection, obligatory treatment in a hospital, because such regulations would hardly touch family circles.

Therefore, the lepers are for the most part helpless people, who require treatment in hospital. The domestic arrangements of the leprosy hospital of this place are the most favorable that can be imagined, and of the same nature, so far as human power extends, are also the general bodily and medical treatment. Consequently the hospital is not only an asylum for poor lepers, but also, comparatively speaking, a safeguard against the development of that disease among the sound population. It would be desirable that this point of view should receive more consideration, and that admission into the hospital, the rooms of which are large enough for receiving a greater number of sick persons, should be sought by more of these unfortunates. But, naturally, admission into the hospital demands the surrender of a great deal of personal liberty, and only, when very ill, are people disposed to subject themselves to this.

According to the annual report of the administration, published in the month of August, there are at present in the leprosy hospital 61 persons, of whom 51 are Brazilians. Of these patients there are 41 males and 20 females; 51 are adults, 10 are children.

During the past year there died 19 lepers. Death was caused in eight instances by cachexia leprosa, in one instance by the consequences of lepra anaesthetica, in four instances by tuberculosis, and in six instances by different diseases.

During the last year there were received at the hospital 23 patients, and 12 were discharged. The discharge, says the medical director, Professor Dr. Gabizo, did not result from any improvement in the conditions of the patients justifying their discharge, but from the fact that their continuance in the hospital is not obligatory, and it is difficult for physicians to struggle against the impatience and desperation of those unfortunates.

RIO DE JANEIRO, *September 15, 1898.*

LEPROSY IN COLOMBIA.

[By James C. McNally, chargé d'Affaires ad interim and consul-general of the United States.]

To one not schooled in the medical profession, a report on such an important subject must be undertaken with apprehension.

To avoid the suspicion of presumption, should this report be given to the public,

I must emphasize my ready acquiescence to the instructions given me by the Department of State, whose obedient servant I am. Should any inconsistencies or misapplication of professional terms creep in, I beg the indulgence of the medical fraternity.

While my report to an extent is superficial, I have endeavored to strike the facts as derived from conversations with physicians practiced in leprosy cases, as well as conversations with lepers themselves. I have discovered in these conversations that those affected with this disease have little knowledge of their earlier symptoms, nor do they fully appreciate the seriousness of their conditions. Some are cheerful in their infirmity, seeing therein a reasonable excuse for begging alms, while others, more sensitive, are buoyed up with the hope of recovery. There are still others in the more advanced stages who will resent the assertion that they are lepers. Leprosy in Colombia to the ordinary observer is as common as rheumatism in the United States and about as little noticed. One meets the outstretched hand of the begging leper with an appalling frequency. The studied prayer of supplication issuing from the pallid lips of the stricken soul impresses one with a feeling of apprehension and insecurity, and, heartless as it may seem, the aspect of horror seems to repel the idea of pity for that of disgust and nausea.

The highways of Colombia are infested with the victims of this loathsome disease, nor is it confined to the rural settlements alone, for in the capital of the Republic one rubs elbows daily with lepers. It is probable that one may occupy the seat in a street car adjoining the one filled by a leper, or kneel next to one in church, which latter place they always frequent, it being, I imagine, the only solace to their suffering souls.

In Colombia lepers are free to come and go at will, to loiter in the public parks and congregate in public places, and ride in one of the few carriages that Bogotá affords, even though the next occupants are among the better people of the city. No restrictions whatever are placed upon the lepers, and I am inclined to the belief that the authorities of Colombia find their resources totally inadequate to cope with the scourge, which is spreading its seeds in the homes of the rich and well-born and the poor and lowly alike. One Rev. Eyasio Rabagletti, a Catholic priest and a recognized authority on leprosy, has just returned from Norway, where he was in consultation with Dr. Armauer Hansen, of Bergen, the famous specialist in leprosy, and head of the leper asylums in Norway. Rev. Rabagletti states in his report that he went to Norway to consult this eminent physician with a view to ameliorate the condition of the country in this regard. He further states that he invited the doctor to visit Colombia and inaugurate a system to retard the progress of leprosy. The doctor, in reply to the invitation, stated that under certain conditions he would be pleased to come to Colombia and take up the work of establishing a system that would in time lessen the ravages of the disease. One condition was that the Colombian Government should ask the Government of Norway to grant the necessary permission. I am informed that the Government of Colombia will on its part cheerfully comply with the condition.

At the present time it is universally admitted in Colombia that leprosy, or *elephantiasis grecorum*, is found widely disseminated in the Republic of Colombia. No accurate statistics can be secured, but persons competent to give a reasonably fair idea of its prevalence, state that in a population of nearly 4,000,000 there are not less than 30,000 lepers. According to physicians and travelers, it is found in every section of the Republic, and exists on the coast as well as in the highest inhabited mountains.

The question of the introduction of leprosy in Colombia is a disputed one. Some claim that the condition of the remains of the aboriginal inhabitants show that the disease existed before the Spaniards came to America, but that it came with the Castilian conquerors does not admit of doubt, as Gonzalo Jimenez de Quesada died of leprosy in the village of Mariquita in 1579, having gained the distinction of

the conqueror of Colombia, founder of the city of Bogotá, and first governor of the country. Others of the early Spaniards died from the same cause. From that time the disease seems to have spread with alarming rapidity, and has extended more rapidly during the last fifty years than at any other time in the history of the country. Some physicians of Colombia support the nomenclature in general use, and state that they recognize different forms: *Lepra tuberosa*, or the tubercular form; *lepra maculosa*, or the spotted or streaked form; *lepra anaesthetica*, or the anaesthetic form; *lepra mutilans*, or the mutilating form; *lepra mixta*, or the mixed forms: and they affirm that all these forms exist in Colombia, while others state that these names are superfluous, and that there is only one form marked by different characteristics.

It is universally recognized that the sufficient and essential cause, without which leprosy never exists, is the *lepra bacillus*, a microscopic organism discovered by Dr. Armauer Hansen, the eminent specialist of Norway above referred to. The doctors of Colombia generally recognize the principle that the disease is produced by microscopic organism that exists only in the human being, and as a consequence the disease is transmitted directly or indirectly from man to man. It is therefore contagious, but only under such circumstances as permit the penetration of the bacilli into the body. One physician who has had large experience in treating the disease says that whenever he asked a leper how he contracted the disease, the invariable answer was that it was the result of a chill, from which the physician infers that a chill is always the first evidence of the existence of the disease. It is stated that in the majority of cases the patients say that for months they have felt a general indisposition, sometimes taking one form and sometimes another, but generally accompanied by chills and fever and general disarrangement of the digestive and circulatory organs, slight fevers, and moral and mental depression. After this period is passed the aspect of the patient becomes characteristic. The face becomes covered with eruptions, especially about the ears: the lobe of the ear becomes thick and assumes a bluish color, and the eyebrows and lashes fall out. The eruptions appear periodically, and then finally extend themselves to different parts of the body. The tongue and the mucous membrane of the nose and mouth are oftentimes attacked, and the testicles, the liver, and kidneys often affected. The duration of life for one who is clearly marked averages from ten to twelve years. The common form is the *lepra tuberosa*, and it is said that there are not more than an eighth part who are afflicted with the second form, *lepra maculosa*, the spotted or streaked form. While the difference is only in the manifestations, it generally terminates in about the same length of time as noted in the first form, although cases have been known to last for forty years. The general symptom is the drying up of the affected parts, which finally advances into the mutilating form and the affected parts rot and fall off. The physicians generally state that leprosy is marked by different forms, calling one tubercular, another maculosa, another mutilating, and stating that there are forms that have all these characteristics.

A number of physicians state that under circumstances leprosy is curable, and they base this assertion on practical studies of the disease made at the asylum for lepers at Agua de Dios. Apart from these cases and others to which reference might be made are spontaneous cures to which one or other form of treatment has been applied, which, however, may not always produce a favorable result in all cases of leprosy. The physical condition of these lepers, or the vigor of their natural constitutions, has enabled them to resist the encroachments of the disease but it is quite certain that a number of cases have apparently been cured.

Dr. Juan de Jesus Martinez B. gives a few cases of spontaneous cure, of which I give an extract:

The first case is that of a man, a native of Charalá, Colombia, 56 years of age, married, and a farmer by occupation. When he was 16 years of age (1859), he

first noticed an insensible spot on the outside of the leg about the size of an American 25-cent piece. Prior to his discovery of the spot he does not remember of ever having associated with or having been in the company of lepers, and the only cause he could give was that he was much addicted to hunting, and was therefore exposed to violent changes of temperature, and to these changes he himself attributes the disease. During three years the insensible spot remained stationary without any change save becoming white, at which time he noticed that his eyebrows began to fall out, and that he lost all inclination to work. There was also noticeable a slight eruption on the body. The next year, 1862, he noticed that his face also began to show signs of the disease particularly on the cheeks and brows. The hands and feet became numb, and he suffered from frequent attacks of fever, during which period there would appear a large number of reddish spots on the body which, at first, soon disappeared, but afterwards became permanent, and were insensible to feeling. A year later the first tubercle appeared on the face, and afterwards on the elbow, knees, cheeks, and ears. About this time his nose began to grow in size, and tubercles appeared on the interior, with the loss of the mucous secretion.

Until the year 1877, when he was 35 years of age, it is difficult to give the details of his changes of health. The eruptions were frequent and in different parts of the body. After some time these eruptions would discharge, leaving in their place large ulcerations. On his lower limbs there were times when the loss of flesh would leave the bones of the leg exposed. During this period a number of bones were discharged from the foot, leaving him deformed. From the year 1877 no new tubercles appeared, the ulcerations slowly healed, and although the insensibility in his limbs remained, yet his general health became better, his appetite good, and he had sufficient strength and will power to do some work. This was his condition in 1884, when he was examined. The skin then had the appearance of parchment, and there were scars all over his body. There was no semblance of eyebrows, he had very little hair, and his beard was equally scarce; his nose was sunken, it had no bone, and was turned slightly to the left. His feet were deformed he had lost the large toe from the left foot; two small toes from the right foot; the other toes being contracted. The sensibility on the body was normal. This was especially so in the palm of the hand and the sole of the foot. It was particularly noticed that where large scars existed that spot was insensible to feeling. Twelve years later he was examined and found in exactly the same condition, and had had no attacks of fever, no eruptions, and had been able to work, and fully believed that he was entirely cured. He attributes his cure to the almost constant use of tea made from the leaves of the myrtle tree.

No. 2. The case of a man, a native of Palmira, Colombia. This man served the Government of Colombia, officially, for several years, was afterwards a country merchant, and later taught school in Agua de Dios. He was married twice, both his wives being lepers. We examined him (says the doctor above mentioned) on the 9th of June, 1897. He had no hereditary taint of leprosy. While in the employ of the Government in the city of Cali, he had occasion to see a number of lepers, but did not come into immediate contact with them. He entered the army and took part in a severe campaign. One night he slept in the mountains, and was exposed to the inclemencies of the weather. The following day he observed the first symptoms of the disease. His hygienic condition up to that time had been good, the only previous illness being an attack of gleet. At 18 years of age there appeared a colored spot on the inside of the left leg, about the size of a 5-cent nickel piece. Shortly afterwards the spot disappeared for a time, but soon reappeared on the outside of the leg. He was cognizant of the insensibility, and was much worried thereby. Within a few months the spot disappeared, and there was no return for fifteen years.

Two years before the disease again appeared he suffered severe mental worri-

ment, and to this he attributes the return of the malady. When 55 years of age, the disease again appeared, the primary symptoms being the loss of strength and spirit, followed by slight attacks of fever. The spots appeared first on his breast, being a dark coffee color. A little later the knee was affected and presented a discoloration. The sensibility disappeared from all these points, extending to his feet, elbows, and hands. In this condition he came to Tocaima to be treated. There some tubercles appeared on his arms; his nose became affected, forming an ulcer that destroyed the fleshy part of the inside of the nose, but not in any way attacking the bone. At this time his eyebrows fell out, as did also his hair, eyelashes, and beard. His face was swollen and presented a lead color, while the ears particularly became very much enlarged. The tubercles would frequently discharge, forming ulcers. The leper states that there were as many as 200 on the body at one time. His medicine consisted of a sirup made from the cornstalk, and he treated the ulcers with various salves. After some time these ulcers began to disappear slowly, over which a skin was formed so fragile that a scratch would cause the sore to break out again. These ulcers were so large and destructive that the tendons could sometimes be seen, and bones were discharged from the hands and feet.

I have endeavored to keep as close to the Spanish text in my translation as I could, and, while in no sense perfect, I am hopeful that the reader may at least grasp the substance. In dealing with this terrible scourge I have tried more to be conservative in my estimates than otherwise. That the disease is increasing in leaps and bounds is beyond dispute, and the inevitable outcome must be mere conjecture.

The general verdict in Colombia is that the disease will not yield to medical treatment, and that while the disease may for a time be arrested, still the end, in its terrible aspect, can not be averted.

Some years ago a physician of Colombia, claiming to be an expert in leprosy cases, announced that he had discovered an infallible cure for this complaint. The effect of this advertisement was to attract the lepers, not only from all parts of Colombia, but from all South America as well.

A place was set aside for treatment, and despite the efforts of the physician the disease would not yield to his treatment, and the lepers, mostly paupers, left the retreat and scattered to all parts of the country. A goodly part of them being unable to get away, remained in Bogota. I am informed that in the departments of Santander and Boyaca nearly 25 per cent of the people are lepers. Isolation seems now to be the only hope for Colombia, and that seems at this time to be impracticable.

The advent of Dr. Hansen's coming should be hailed with acclamations of thanksgiving, for, should he put into effect his rigorous system of isolation so successful in Norway, the blessings of hope might disperse the clouds of somber anticipation and give birth to a strenuous effort to free from the clutches of leprosy a country of much promise.

BOGOTÁ, *April 10, 1899.*

LEPROSY IN BARRANQUILLA, COLOMBIA.

CONSULATE OF THE UNITED STATES,

Barranquilla, Colombia, April 17, 1899.

SIR: In compliance with instructions contained in Department circular dated January 10, 1899, I have the honor to transmit the following report as to the prevalence of leprosy in this consular district. I regret to say that no recent statistics on the subject are available. In my efforts to secure some reliable information on the subject, I have consulted leading physicians and such other persons as have

given the matter their attention here. The total number of lepers in the Republic has been estimated at 30,000. The greatest part of these are in the Departments of Santander and Cundinamarca. There are said to be about 1,400 on the Atlantic coast. I am informed that in the city of Barranquilla, the capital of the province of Barranquilla, which has an unofficially estimated population of 40,000, there are about 20 lepers. In the town of Soledad, about 6 miles distant from Barranquilla, it is claimed that there are about 40 lepers. At Rio Hacha and vicinity there are about 50 lepers. I am informed that at Santa Marta there is little or no leprosy. There are in the country three leper lazarettos, as follows: One at Contratación, in the Department of Santander, with 5,000 patients. Another at "Agua de Dios," in the Department of Cundinamarca, with 2,000 patients, and a third at Cano de Loro, in the Department of Bolívar, with 300 patients. The lepers of this city and vicinity and those at Soledad and Rio Hacha are allowed to go about at will. In this city lepers are seen begging on the streets. If the actual number of lepers in the country is nearly as great as the estimate given, it will at once appear that but a small proportion of them are in the lazarettos. I am told that in 1896 an effort was made by the General Government to secure positive statistics as to the prevalence of the disease in the Republic, and to this end each of the governors throughout the country was instructed to ascertain and report the actual number of lepers in their respective Departments. It is claimed that such statistics were secured, but that they have not as yet been published.

From my general observation and from the information which I have received, I am led to believe that little attention is paid to the disease by the authorities.

I am, sir, your obedient servant,

W. IRWIN SHAW,
United States Consul.

THE ASSISTANT SECRETARY OF STATE,
Washington, D. C.

LEPROSY IN THE DISTRICT OF COLON, COLOMBIA.

COLON, COLOMBIA, *March 6, 1899.*

SIR: In compliance with Department circular of January 10, 1899, I have the honor to report as follows:

In regard to the prevalence of leprosy in my consular district, I have been able to locate but one case, this one in Co'on, but have been informed by local authorities here that this disease is much more plentiful in the interior of Colombia, on the Magdalena River; but, as there is no means of communication between here and that point, I have been entirely unable to learn anything definite as to the number of cases.

I have been informed that it is a mild form that exists here and develops very slowly.

I am, sir, your obedient servant,

W. W. COBBS,
United States Consul.

THE ASSISTANT SECRETARY OF STATE,
Washington, D. C.

LEPROSY IN ECUADOR.

CONSULATE-GENERAL OF THE UNITED STATES,
Guayaquil, Ecuador, July 12, 1899.

SIR: I have the honor to transmit herewith report on leprosy, together with essays on same subject by Dr. Rivadeneira, surgeon in chief of national hospital at Quito.

To obtain this has been very troublesome. The hospitals are at Quito and Cuenca. The surgeon at latter place is a fugitive, having taken a prominent part in the late revolution. It was impossible to get any data in Guayaquil, and my letters to Quito received no attention from the doctor until I invoked the aid of Minister Sampson, who, after weeks of effort and a visit to the lepers' hospital, accompanied by Mrs. Sampson, at last succeeded in inducing Dr. R. to make a report and furnish the papers transmitted. * * *

Your obedient servant,

PERRY M. DE LEON,
United States Consul.

The ASSISTANT SECRETARY OF STATE,
Washington, D. C.

[Inclosure.—Extract of letter from Minister Sampson.]

QUITO, May 6, 1899.

1. Leprosy exists in Ecuador, and its complete history is noted in monograph on subject by Dr. Genaro Rivadeinera G., the physician in charge of the Quito Leper Asylum.

2. In Quito there are 37 male and 40 female lepers. In Cuenca there are 30 male and 35 female lepers. The population of the first city is 80,000, and the second 30,000 inhabitants. All the lepers of the Republic are isolated in the hospitals of Quito and Cuenca.

3. I believe that heredity and contagion are the principal causes in the propagation of leprosy.

4. The climatic conditions of Quito are not as favorable for the spread of leprosy as those of Cuenca. Most of the lepers in Quito have been brought here from Ambato. Quito is at 2,850 meters elevation: temperature, 13.5° C. Cuenca is at 2,541 meters elevation: temperature, 14.6 C.

5. I know of many examples of seeming contagion, but there are many cases of atavism. I have also seen cases resembling the propagation of syphilis.

6. Concerning the appearance, it can be said that it comes at the age of puberty, although there are congenital cases.

7. Here the most frequent form is the tuberculous. At present the mutilating form of leprosy does not exist.

8. The best treatment depends upon the length of time of the leprosy, on its form, and, above all, its complications. I employ with success antiseptics, tonics, depuratives, etc., the chaulmoogra oil, resorcine, arsenical compounds, carbolic acid, the cloome anamale, and some vegetables as depuratives, etc. (See Monograph.)

9. I commenced to treat lepers in Quito in 1886, and I am the only doctor in the establishment. It is sustained by public charity. It requires a large sum of money to run this annually, as under the same management are the paupers, the orphans, the inebriates, etc. There are in it 1 administrator of income, 12 sisters of charity, and about 35 servants. These also act as attendants to the orphans, etc., under same management, and to the lunatics in the adjoining buildings.

10. In the monograph you will find all details upon the subject of condition, wants, and sufferings of lepers. Dr. Rivadeinera is convinced that leprosy is contagious, but can be inoculated and can be cured at its commencement; that syphilis is antagonistic to leprosy, and that it is important to make some careful studies about this disease in order to find its specific.

He states that in the thirteen years he has been treating leprosy in Quito 14 patients have been discharged as cured, "so pronounced by a board of physicians," and 2 more are nearly ready to go out, cured.

LEPROSY IN BRITISH, DUTCH, AND FRENCH GUIANA.

CONSULATE OF THE UNITED STATES,
Demerara, British Guiana, March 15, 1899.

SIR: In accordance with Department circular of January 10, I have the honor to inclose for the consideration of the Treasury Department a report as to the prevalence of leprosy in this consular district.

I am, sir, your obedient servant,

GEO. H. MOULTON, *Consul.*

THE ASSISTANT SECRETARY OF STATE,
Washington, D. C.

[Inclosure.]

LEPROSY REPORT.

Demerara, British Guiana.—In accordance with instructions in Department circular of January 10, I have the honor to submit the following report of the prevalence of leprosy in this consular district:

Leprosy in Demerara existed as far back as 1796, being originally introduced by the blacks from Africa during the early period of slavery in the colony. It is considered the focus and the only channel through which the disease has finally become endemic in parts of South America and the West Indies. Its spread throughout the colony dates from the emancipation in 1838. Previous to that time the leprosy cases were kept on the estates where they belonged. As soon as a case developed on a plantation it was at once isolated to the most remote boundary, where a hut was provided for the occupant. The disease did not spread to any extent during the period of slavery because of the wise restriction affecting the sexes and the isolation adopted. In 1831 there were 431 lepers in the colony. At this time immigration from China and the East Indies had not begun, and there are no records showing that any other race but the black was affected. From 1831 to 1861 there was an increase of 119 cases. A general leper asylum was instituted at Mahaica, 20 miles from Georgetown, on the 19th of May, 1858. It had as inmates at that time 66 males, 11 females—total, 77. The remaining number were permitted to roam about and the disease spread. From that time to the present the number of inmates of the asylum has steadily increased. It has been estimated that 1 in 500 of the population suffers from leprosy. Since 1877, when the mortality was 16½ per cent, the percentage has decreased to 8½ per cent in 1898, due to segregation, improved methods in management, diet, etc. The asylum is favorably located at the mouth of the Mahaica River, which empties into the Atlantic Ocean. The grounds are free from grass and weeds and shelled. The inmates are encouraged to engage in such industrial pursuits as are considered proper for them. Schools, amusement, and religious advantages are provided. The asylum is directly in charge of a medical officer and an efficient corps of subordinates, and is subject to the inspection of the surgeon-general of the colony. The cost per day per head for maintenance is about 16½ cents.

According to published statistics for 1898 there were in the asylum during the year 482 leprosy patients, as follows:

	Natives.	Islanders.	Africans.	Coolies.	Chinese.	Portu- guese.	Children.
Males	122	20	9	198	7	14	.....
Females	77	3	3	13	2	4	10
Total	199	23	12	211	9	18	10

Mortality.—Of the three recognized varieties of leprosy the deaths were as follows:

	Males.	Females.	Total.
Anæsthetic	17	5	22
Tubercular	5	1	6
Mixed	13	0	13
Total	35	6	41

Of those who died, 19 were from India, 16 were natives, 5 were islanders, and 1 African. Nine died from leprosy, and the rest from intercurrent afflictions, mostly Bright's disease and tuberculosis. Twenty were sent to India, 14 were discharged, and 33 absconded.

The anæsthetic variety of leprosy is most common in this country. The published statistics for a series of years show the mortality in this variety to be about the same in both sexes. In tubercular lepers it is greater in the male sex. The law provides for the gratuitous treatment at the asylum of all lepers who may apply. Any leper exposing himself in any public place may be summoned before a magistrate, who may, upon conviction, order the person to the asylum; no such order to be made if security in the sum of \$96 be given for the treatment of the case in private, and not suffered to be at large or to endanger the public health. A leper may also be discharged from the asylum at any time, whether cured or not, by giving security in the sum of \$96 that such inmate shall be properly maintained and treated in private and not suffered to be at large. It seems to be generally understood that the annual publications of leprosy cases do not cover the actual number in the community. I have no means of ascertaining, even approximately, the number of private cases scattered throughout the colony. It is a common sight to see lepers in the public thoroughfares of Georgetown. It is plain that the leper law is defective, in that it does not make the segregation of the entire leprosy population mandatory. Lepers are allowed to intermarry, and they do.

PARAMARIBO, DUTCH GUIANA.

Consular Agent Deyo, in his report, states that prior to the immigration of African slaves leprosy did not exist in Dutch Guiana, and that it was introduced by them into the colony where it has existed every since. The popular impression there is that the disease is not spreading, which is due probably to the fact that the law segregating leprosy cases is strictly enforced. There is a leper asylum at Chatallion, on the Surinam River, four hours by steamer from Paramaribo. The place is surrounded by bush, and there is no communication with the place except by Government steamer. The number of inmates is as follows:

Adult males	84
Adult females	29
Boys over 10 years	5
Girls over 10 years	4
Total	122

Unofficial estimates by physicians and churches place the number of lepers in the colony at 500, but popular belief, in which the agent concurs, places the number at 1,000.

The Roman Catholics recently erected an establishment outside the city for the care and treatment of the lepers belonging to their religious denomination, and while it is maintained at the expense of the society, the Government exercises strict supervision. There are 50 inmates at present.

Lepers who seclude themselves from public places and keep inside their residences, the agent asserts, can not be reached by the existing law. Those found in public places or thoroughfares are at once apprehended and taken to the asylum at Chatallion. Both Protestants and Catholics provide religious advantages at the leprous settlement. The former society is about to erect at the settlement a suitable place to care for those cases which are able to pay for treatment. While the establishment will be maintained by them it will be under Government supervision.

CAYENNE, FRENCH GUIANA.

Consular Agent Lalanne reports that leprosy in French Guiana is increasing, and that in his judgment one-tenth of the 11,000 population of the city is contaminated. The leprosy hospital is in the little village of Acaronany, which, on the 31st of December, 1898, contained only 20 patients, which is but a very small proportion of the total number in the colony. This, in the opinion of the agent, is due to the lax execution of the law. Leprous cases may be seen on the public streets and in very many of the dwellings of the city.

The criticism applied to the law in British Guiana applies to that of French Guiana, and the enforcement of the law in Cayenne is even more lax than in Demerara. The French colonial law in one respect is better than that from this colony, in that it provides for the isolation of those who prefer to be treated in their own house at a distance of at least 2 kilometers from Cayenne and 1 kilometer from any village or town.

From the information obtained it would appear that the Dutch are more conscientiously enforcing the law segregating their lepers than any of the colonies in this consular district, and that while the general impression in British and French Guiana is that leprosy is increasing, that is not the case in Dutch Guiana. From the standpoint of the laity the disease is regarded as contagious. Professional opinions may not yet be in accord, but I believe the preponderance of opinion in this country is with the laity.

I am, sir, your obedient servant,

GEO. H. MOULTON, *Consul.*

DEMERARA, *March 15, 1899.*

LEPROSY IN PARAGUAY.

CONSULATE OF THE UNITED STATES,

Asuncion, Paraguay, March 2, 1899.

SIR: I have the honor to transmit as my report on leprosy, called for by circular of January 10, 1899, the official letter sent me by the medical board on that subject.

There may be more, but they fix the number definitely at not under 150, and are arranging for a leprosy asylum.

See the board's letter with translation.

I am, sir, your obedient servant,

JOHN N. RUFFIN,
United States Consul.

The ASSISTANT SECRETARY OF STATE,
Washington, D. C.

[Inclosure—Translation.]

ASUNCION, PARAGUAY, *February 28, 1899.*

SIR: I have the pleasure to acknowledge receipt of your courteous note of the 21st instant, in which you solicit from the honorable medical board some information upon leprosy and the approximate number of lepers.

At this moment the medical board is occupied in founding a leprosy asylum under the auspices of the superior government of the Republic, into which all the lepers will be gathered. Therefore of late the exact number can not certainly be known; but at present it can be said with safety the number will not be under 150, distributed through the whole Republic.

Hoping this will meet your requirements, I have the honor to greet you with my most distinguished consideration.

Mr. JOHN N. RUFFIN,

Consul of the United States.

NO LEPROSY IN URUGUAY.

CONSULATE OF THE UNITED STATES,
Montevideo, February 10, 1899.

SIR: Answering the Department's circular dated January 10, 1899, regarding leprosy and its prevalence in Uruguay, I beg to say that the bureau of hygiene reports none existing in the Republic.

Very close watch is kept at all ports against any introduction of lepers, and none have been detected for several years.

I am, sir, your obedient servant,

ALBERT W. SWALM, *Consul.*

The ASSISTANT SECRETARY OF STATE,
Washington, D. C.

LEPROSY IN VENEZUELA.

CONSULATE OF THE UNITED STATES,
Maracaibo, February 20, 1899.

SIR: I have the honor to acknowledge the receipt of the circular from the Department of State of January 10, 1899, inquiring for information regarding leprosy, for the Treasury Department.

As I am familiar with leprosy since many years I shall forward copies of the dispatches sent to the Department during the past years upon the subject since 1882, as well as all information I can gather until this date. As this will take quite a considerable time I hope the Department will excuse should my dispatch upon the subject come only in a few weeks from to-day. I also intend to await the arrival of one of the Red D steamers plying directly from this port to New York. My intention is to give the large package to the master of the steamer to mail it in New York to the Department, to save the heavy postage now demanded upon all letters sent from Venezuela.

I have the honor to be, sir, your most obedient servant.

E. H. PLUMACHER,
United States Consul.

The ASSISTANT SECRETARY OF STATE,
Washington, D. C.

CONSULATE OF THE UNITED STATES,
Maracaibo, March 13, 1899.

SIR: Referring to your instruction in Department's circular of 10th January last, relating to leprosy, and also to my unnumbered dispatch dated 20th of February, 1899, upon the subject, I have to-day the honor to report that all that is

known here in regard to this loathsome disease is inclosed in the adjoining copies, mostly taken from my official correspondence with the Department of State.

We have on the leper island (Isla de Lazaros), opposite to the city of Maracaibo about 150 of the unfortunates, isolated under the care of a special physician, with quite a staff of employees and about a dozen Sisters of Charity. These good sisters are Spanish ladies who have devoted their lives to those poor "disinherited" of the human race. There is also a strong police force on the island to prevent the escape of the lepers.

They see the city lying before them, with all its bustle and life; they see the large sailing vessels and steamers passing by; many can see the houses of their families; they hear the chimes of the church bells in the city; the evening breeze brings them the sweet sounds of the music from the military band playing in the "plaza," but they can not leave the island any more; they must live and die there.

Those unfortunates who are once landed on the "Isla de Lazaros" must "leave all hope behind."

I calculate the number of lepers which are not taken up and live concealed in the city and surrounding boroughs to be about several hundred.

Many of them who have rich parents or relations do their best to escape the vigilance of the Government, and are secreted.

I can well sympathize and feel with the relatives of the afflicted, and also with him if he is educated; yet public interest demands imperatively that all should be taken away from their families and sent to the island.

Personal influence and money have no doubt a great deal to do with it. In many a rich old family of this State the disease has its victims.

I remember that about eighteen years ago, when I was temporarily in charge of the French interests in west Venezuela, I was ordered by the French minister of foreign affairs to present a high decoration to a physician here. I became intimately acquainted with him, and I found him to be a man of great culture and knowledge. He confessed to me that the loathsome disease had taken hold of him, and warned me not to visit him. Not being afraid of the disease I have seen much of him; but returning from leave of absence I found he had died suddenly.

It is only about nine years ago when we had a splendid man as constitutional president of the State of Zulia; he was a physician, a lawyer, and an architect. I had been at many receptions given by him, and admired the gentleman in his healthy physical vigor and great intelligence.

A few years afterwards, when he had retired from political life, I heard that he was very sick and that he did not receive any of his friends. I was then experimenting on 10 lepers at the island with a new medicine, and his wife permitted me to see him. It was indeed a horrible sight. He was but a skeleton. Some of his fingers and toes had already gone, the bridge of his nose, and one of his eyes.

His body covered with large ulcers, his political enemies in power concluded that he had leprosy, and it had been ordered that he should be sent to the leper island. This was too much for him, and a few days before his removal he found the way to isolate himself beyond all misery and humiliation.

I cite these two cases to show how absolute isolation should be insisted upon by the authorities. Unfortunately neither the federal Government of Venezuela nor the State Government have to-day the means to act effectively.

There is much leprosy in Venezuela and it is on the increase, but nothing in comparison with our neighboring Republic of Colombia. I have seen reports of high-standing physicians in that Republic who declared openly that one-sixth of the population of the State of Santander, adjoining this consular district, is more or less impregnated with this terrible disease, as there is no law of isolation.

Years ago the Chaulmoogra was tried at our leper island, but with little success. The medicine did not agree with many of the patients, who were already in such feeble state that they could not stand the remedy. Later on the medicine fur-

nished by Dr. Sam. C. Bothwell was tried on 10 lepers, and according to my observations when in charge of these cases the medicine was bettering the physical condition of the patients; especially the offensive ulcers disappeared. This was discontinued for want of funds.

Recently the extract of the Tua Tua plant, which is said by Colombian physicians to be of great value, will be tried, but we have as yet no results to record.

I have the honor to be, sir, your most obedient servant,

E. H. PLUMACHER,
United States Consul.

The ASSISTANT SECRETARY OF STATE,
Washington, D. C.

LEPROSY IN MARACAIBO, VENEZUELA.

UNITED STATES CONSULATE,
Maracaibo, August 30, 1890.

SIR: I have the honor to submit the following report upon the "lazaretto" or leper hospital of Maracaibo, an institution of great merit and usefulness, and being one of the best and most perfect of its kind in the world it is well worthy of study.

Soon after my arrival at Maracaibo in 1878 my attention was particularly called to this institution on account of the excellent judgment displayed in its management, the care with which every new method of treatment was tested, and the general zeal in the cause of science and humanity which has always been characteristic of its directors. I frequently took occasion to visit the island upon which the lazaretto is situated, and concluded in 1882 to make an official report upon the subject, with the intention of forwarding to the Department a large number of photographs of patients in various types and stages of the disease, which might be interesting to the medical world and of practical utility in the investigation of the more salient outward features of leprosy.

It was impossible, however, at the time to secure a photographer willing to undertake this somewhat repulsive task, and my report as then forwarded was lacking in many points of interest which I shall now endeavor to supply, especially as in late years many improvements have been made in the working of the institution which did not appear in my former communication. I am pleased to be able to forward at present a collection of photographs taken on the spot and under my supervision, the description of which will be found at the conclusion of this report.

I beg leave to submit a few general remarks concerning leprosy in this country, with also a brief account of the excellent institution established here for the isolation and treatment of determined cases.

Although it is more probable that leprosy has existed in Venezuela from a remote period, it is claimed by native authorities that until 1825 this section was free from the scourge, and that in that year a native of Santo Domingo suffering from the disease landed at Maracaibo and spread the infection, until now the matter has become a serious question.

In 1828 the growing evil of leprosy attracted the attention of the more thoughtful, and the initiative was taken by the renting of an island in the lake about 4 miles east of Maracaibo. This was done by the National Government under the auspices of Bolivar, and in 1841 the island was definitely purchased and transferred to the State of Zulia, the federal Government erecting buildings for the reception of patients, these accommodations being increased in 1873. It was not until 1876, however, that a movement was fairly inaugurated deserving

unlimited praise, and which has continued with constant zeal and energy to the present day.

At that period various ladies of Maracaibo set seriously to work to secure funds for the amelioration of the condition of these unfortunates, and for the rigorous prosecution of the task of apprehending and isolating at the lazaretto the cases of disease still at large, which had assumed alarming numbers, such as to seriously endanger the sanitary future of this section. This work is both difficult and disagreeable, the friends of the infected, from a mistaken kindness, diligently concealing them from the search of the authorities. The humane efforts of the ladies were well seconded by society in general, and in 1879 a fresh impetus was given to this work of charity by the appointment of a junta with extended powers to apprehend all lepers, send them to the island, and to dictate measures for their maintenance and treatment, and for the general discipline of the lazaretto.

It is to the work of this organized board that especial attention is due, and the result of its labors has been extraordinary, considering the obstacles encountered and the trifling aid extended by the Government to this work of truly national importance.

In various parts of Venezuela there are places designated for the treatment of leprosy, but the Maracaibo Lazaretto is the only one organized on a systematic and extended plan, and it is to be hoped that in view of its exceptional advantages it may be selected as a place of seclusion for the entire Republic, in which case it will no doubt become a point of great interest to the medical and philanthropic world. My visits to the island have much impressed me with its suitability, and the system pursued can not be too highly recommended.

At present there are about 125 patients, although it is believed that there are many more still at large in the city and its environs, who are being apprehended as rapidly as the resources at the disposal of the junta permit.

The interior arrangements of the island are excellent. Capacious cisterns insure a supply of fresh water, and within the last few months waterworks by means of a windmill have been erected, which give an ample supply of lake water in the different wards and rooms. This has been done at a cost of \$2,000, which was generously contributed by a single mercantile firm of this city, and the inexhaustible quantity of running water thus secured renders it easy to keep all parts of the establishment in a cleanly condition, besides allowing irrigation of the cultivated portions of the island. The diet is wholesome and abundant, and the average cost of the maintenance and treatment of each person amounts to about \$13 in American money monthly. A comfortable building has been erected for the use of the employees, while for the patients a large edifice built of concrete, forming a parallelogram, with a courtyard in the center, is divided into separate apartments, plainly but sufficiently furnished.

A neat chapel has recently been built, where every Sunday religious service is held and the sacraments administered to those who may so desire. A pleasant feature is the establishment of cottages with ground attached, in which reside those patients whose means permit it.

Land is given free to anyone who is able to erect a dwelling, and as there are quite a number who possess certain incomes, little homesteads are soon formed, giving the island a cheerful aspect. It was at first a much mooted point as to whether marriages should be permitted among the patients, and after a lengthy investigation and discussion it was finally determined that past experience warranted the belief that such unions would prove unfruitful, and consequently various weddings have been celebrated.

For years the theory of sterility was not contradicted by experience, and seemed about to be definitely settled, when two births occurred on the island, both the parents in each case being lepers.

It has always been well understood that a union between a sound and a diseased

person would be liable to result in the propagation of diseased offspring, but until the occurrence of the births referred to it was believed that two undoubted lepers could not procreate; and in these two exceptional cases I would be inclined to ask whether a mistake may not have been made in the diagnosis of one or the other of the parents, confounding with true leprosy some other physical taint, which though similar in appearance may be different in kind.

Be that as it may, neither one of the two children has as yet shown symptoms of the disease, and in March of last year one of them who had reached the age of 14 years, having passed his whole life on the island with his leprous parents, was allowed to return to society after having been formally pronounced clean by a board of competent experts. This is but one instance of the puzzling character of the disease.

The general effect of this marriage has no doubt been to induce more cheerfulness and resignation and to add greatly to the good discipline of the establishment. Although marriages would not be allowed between a sound and a diseased person, yet in the case of the development of leprosy in one of a couple after marriage, the sound consort is permitted to accompany the other to the lazaretto, and this has occurred in many instances.

With the system of separate cottages for those who desire them, the island is beginning to assume the aspect of a rural municipality.

Its extent is a little more than a mile square, with good soil, of which advantage has been taken by the well-to-do patients for the cultivation of various products and the breeding of goats.

The territory has been artificially stocked with game, which is now becoming abundant, and nothing seems to have been left undone to secure the comfort and welfare of these unfortunates.

A reading room and library are at their constant disposal, and occasional musical entertainments are furnished by the junta, all its efforts being directed to the establishment of a veritable home for the patients where they may, as far as possible, forget their afflictions.

Weekly visits of relatives and friends are permitted, which are looked forward to with eager anticipation, and the discipline generally is mild and judicious, punishment being meted out with justice and humanity to evil doers, a proportion of whom must naturally be found in every community, even one of lepers.

The disease assumes various phases, the most common type being the tuberculous, manifested in distorted features, enormous pendant ears and lips, and an abundance of exaggerated wrinkles.

* * * * *

Various methods of treatment have been tested at the Maracaibo lazaretto, especially the administration of the oil of *Chaulmoogra*, which apparently gives encouraging results at first but produces no lasting benefit. Its use is also attended with grave physical inconveniences, such as a morbid state of the liver, intestinal irritations accompanied with slimy and waxy diarrhea, wandering pains in various parts of the body, eruptions upon the skin, principally attacking the hands and various other unpleasant symptoms, making the use of the *Chaulmoogra* at times intolerable. This treatment has always been entirely voluntary, but no one has been able to persevere in its use.

The administration of tonics and astringents has appeared to give good results, and Dr. Flores seems even to believe that by constancy in their use an almost absolute cure could be obtained. The iodides and mercurial preparations have also been tested as well as the tincture of cantharides, but all of these remedies produce more or less identical effects, that of a temporary amelioration of the condition of the patient, but without well-founded hopes of anything approaching a genuine cure.

Dr. Flores, who is a warm partisan of the parasitic theory, believes in the use of camphor in the form of a sirup as one of the best methods of combatting the disease, and his enthusiasm leads him so far as to state that he is convinced that leprosy is curable if not allowed to pass certain limits, and that even those in the worst stages will derive marked benefit from the camphor treatment. So far, however, these are theories and nothing more.

As already stated, temporary alleviation has frequently been obtained by various methods, as in a disease like leprosy any remedy which tends to improve the state of the blood and the general health will no doubt have its temporary ameliorating effect upon the malady itself. So many years of careful study and of patient and conscientious application of all methods of treatment have, in my opinion, satisfactorily demonstrated the incurability of the disease, and the most that can be done is to alleviate as far as possible the physical suffering and mental distress.

In connection with the various methods of treatment, it may be interesting to note that among the ignorant an idea is prevalent that leprosy may be cured by a diet of buzzard flesh and soup.

As it is necessary, however, that this regimen be observed with constancy, almost to the exclusion of other food, it is easy to imagine that not even the most zealous upholders of this remarkable remedy have been able to give it a satisfactory trial.

Referring to the possibility of error in the diagnosis of leprosy there is at present in the lazaretto a patient who, after three years' residence, is still considered a doubtful case.

He was finally removed from the island and placed in one of the city hospitals, where, for several weeks, he was closely observed by a board of physicians, all treatment being discontinued. No agreement of opinion could be arrived at, and he was again transferred to the island, where he still remains. In addition to the views of Dr. Flores already quoted he expresses as follows, at my request, his opinion respecting the various causes of leprosy and the possibility of contagion.

In regard to the latter it will be noticed that although the Doctor is an advocate of the contagion theory, yet he also states that to so transfer it from one person to another the latter must have a certain leprous predisposition, an admission which would clearly indicate that leprosy *per se* is not contagious.

The following is a translation from the Doctor's note:

"Among the principal causes of leprosy are hereditary taint and the effects of secondary and tertiary syphilis.

"In my practice I have observed many cases in which the disease had passed from generation to generation, and I have noticed that leprosy, unlike most hereditary complaints, rarely disappears in one generation to reappear in the next.

"One of the parents being a leper, the son is in imminent personal danger even should he have been procreated before the appearance of the first symptoms in the parent. As regards syphilis, leprosy will never be developed from its primary phases, but in this country it is considered nothing remarkable to see persons suffering from secondary or tertiary symptoms converted into unmistakable lepers, and much the more if the syphilis is inherited. Among other causes may be mentioned alcoholic excesses, uncleanness, sudden chilling of the body, and all circumstances which may cause physical or moral depression, leprosy being one of the phases of tuberculous diathesis. Respecting contagion, I have always believed that contact accompanied by constitutional predisposition will produce the disease, and also that with this predisposition on the part of an individual he may be infected by simple proximity.

"To explain better, if the predisposition exists, immediate contact will infallibly produce leprosy, and ordinary proximity and intercourse will probably have

the same effect and if the constitution is prepared to receive the disease, the most insignificant occurrence may develop it.

"It is probable that the microbes of leprosy do not solely produce the disease, as in that case no doubt all persons who dedicate themselves to the care of the sufferers and live intimately with them would be infected, and the more so, if as teaches a certain professor, these animalculæ find their nutriment in oxygen, which is one of the elements most abundant in the human organism.

"We see, however, the contrary at the lazaretto, where persons whole and healthy devote themselves to the care of their diseased relatives, living in the same apartments, using the same utensils, and washing their clothing.

"In the case of husband and wife, of which there are many examples on the island, the intimacy of conjugal life would seem to offer special dangers, but all these devoted attendants retain their normal health, although many have been in the lazaretto for years.

"In order to produce the contagion it is necessary therefore that the person contracting the disease be under the influence of certain special conditions and surrounded by certain causes, and that his system be prepared beforehand to receive the leprous germ; in other words, the ground must be prepared for the planting of the seed."

Such are the views in brief of the physician who for years has been in medical charge of the leper hospital, but which, as already stated, are by no means in entire accord with my own opinion.

At present none of the patients are undergoing treatment for leprosy. Indeed, as the disease is generally acknowledged to be incurable, it has always been left to the lepers themselves to decide whether or not they should undergo a course of treatment, and the results of the administration of all remedies have not been so encouraging as to induce the inmates of the lazaretto to submit to the unpleasant effects of Chaulmoogra and other medicines, when but little or no benefit is anticipated from their use.

Dr. Flores informs me, however, that upon the arrival of the Sisters of Charity, various of whom have been recently engaged in Europe as nurses for the lazaretto, he will endeavor to pursue further remedial investigations.

I am in hopes that this report may be the means of calling deserved attention to the Maracaibo lazaretto, which in its arrangements and discipline is equal if not superior to any other institution of its class in the world.

This may appear a bold assertion, but I believe it fully warranted by the facts.

I have the honor to be, sir, your most obedient servant,

E. H. PLUMACHER,

United States Consul,

HON. WILLIAM F. WHARTON,
Assistant Secretary of State, Washington.

*Leprosy as reported to the Surgeon-General United States Marine-Hospital Service,
from October 1, 1898, to November 1, 1899.*

Place.	Cases.	Remarks.
Brazil:		
Bahia	21	In 1898.
Pernambuco		Leprosy reported.
Rio de Janeiro	61	In 1898.
British Guiana:		
Demerara	482	Do.
French Guiana:		
Cayenne	20	
Dutch Guiana:		
Paramaribo	122	
Colombia:		
Agua de Dios	2,000	In a lazaretto.
Barranquilla	20	
Bogota		
Cano de Loro	300	Do.
Contratacion	5,000	Do.
Panama and vicinity	30	
Rio Hacha	50	
Soledad	40	
Taboga	4	
Cuba:		
Matanzas		1 death.
Nuevitas	3	
Puerto Principe	5	
Santiago	3	
Ecuador:		
Cuenca	65	In 1899.
Quito	77	Do.
Paraguay:		
Asuncion	150	In February, 1899.
Porto Rico:		
San Juan	12	Do.
Venezuela:		
Maracaibo	150	Do.
Total	8,615	

INVESTIGATION OF LEPROSY IN THE UNITED STATES.

As stated in the annual report for 1898, page 646, a bill was introduced in Congress providing for the investigation of leprosy in the United States, which passed the Senate and was favorably reported upon by the House Committee on Interstate and Foreign Commerce. Since the issuance of the last report that bill has become a law and is as follows:

AN ACT For the investigation of leprosy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Supervising Surgeon-General of the Marine-Hospital Service, under the direction of the Secretary of the Treasury, shall appoint a commission of medical officers of the Marine-Hospital Service to investigate the origin and prevalence of leprosy in the United States, and report upon what legislation is necessary for the prevention of the spread of this disease; the expenses of this investigation, not exceeding the sum of five thousand dollars, to be paid from the fund for preventing the spread of epidemic diseases.

Approved, March 2, 1899.

Preliminary measures have been taken toward appointing a commission and mapping out its work.

ARTICLES AND REPORTS ON LEPROSY CONTAINED IN THE ANNUAL REPORTS OF THE MARINE-HOSPITAL SERVICE AND IN THE WEEKLY ABSTRACTS OF SANITARY REPORTS AND THE WEEKLY PUBLIC HEALTH REPORTS PUBLISHED BY THE MARINE-HOSPITAL SERVICE.

For convenience of reference I have caused to be prepared the following list of articles and reports on leprosy which have appeared in the publications of the Marine-Hospital Service:

BIBLIOGRAPHY OF LEPROSY AS FOUND IN PUBLIC HEALTH REPORTS.

Weekly Abstract of Sanitary Reports, 1888, Volume III, page 96:

Report relative to leprosy from Honolulu, Hawaii.

Weekly Abstract of Sanitary Reports, 1889, Volume IV, page 457:

Circular regulation to prevent introduction of leprosy into the United States.

Leprosy in Cape Colony, pages 332-333.

Leprosy in Cuba, page 361.

Leprosy in Spain, page 361.

Leprosy in Georgetown, Demerara, page 265.

Leprosy in Minnesota, page 332.

Leprosy in Sandwich Islands, page 360.

Leprosy in San Francisco, Cal., page 133.

Leprosy in Turkey, island of Samos, pages 450-452.

Resolution of American Public Health Association relative to quarantining Florida against introduction of leprosy from Cuba, page 361.

Weekly Abstract of Sanitary Reports, 1890, Volume V, pages 148-149:

Measures to prevent spread of leprosy in Norway.

National legislation requested regarding leprosy by California State Board of Health, page 98.

Opinions on the contagiousness of modern leprosy, page 22.

Question of leprosy before the Imperial Society of Medicine, Dr. Virchow, page 234.

Local inspectors on the Ohio frontier to prevent introduction into United States, page 107.

Transmission of leprosy from China by prostitutes, pages 163-164.

Contagiousness of leprosy, pages 418 and 459.

Danger of introduction of leprosy through the Northern frontier, pages 40-41.

Disposition of lepers, pages 533-535.

Special report, with photographs of leprosy, page 605.

Leprosy in Philadelphia, Pa., page 533.

Leprosy in Fiji Islands, page 589.

Leprosy in Puerto Cabello, Venezuela, page 337.

Leprosy in Boston, Mass., on steamship *Cephalonia*, page 203.

Leprosy in Indiana, page 203.

Leprosy in Minnesota, page 536.

Leprosy in Mississippi, page 179.

Leprosy in New Orleans, La., page 533.

Leprosy in New York, page 313.

Leprosy in St. Louis, Mo., page 50.

- Weekly Abstract of Sanitary Reports, 1891, Volume VI:
 Prevention of the introduction of leprosy, page 71.
 Resolution relative to leprosy by Pennsylvania Board of Health, page 571.
 Leprosy in Cuba, page 71.
 Leprosy in Para, Brazil, pages 35, 150, and 171.
 Leprosy in United States of Colombia, page 533.
- Weekly Abstract of Sanitary Reports, 1892, Volume VII:
 Leprosy, ordinance for checking in Malta, page 272.
 Leprosy in San Francisco, Cal., on steamship *China*, page 179.
 Leprosy in the Northwestern States, page 167.
- Weekly Abstract of Sanitary Reports, 1893, Volume VIII, page 963:
 Leprosy in Demerara.
- Weekly Abstract of Sanitary Reports, 1894, Volume IX, page 1112:
 Leprosy in Bahamas.
- Weekly Abstract of Sanitary Reports, 1895, Volume X:
 Leprosy in Iceland, page 84.
 Leprosy in Ohio, Perry County, page 71.
 Leprosy in Pennsylvania, Philadelphia, page 168.
- Public Health Reports, 1896, Volume XI, pages 78-79:
 Serum therapy in leprosy.
- Public Health Reports, 1896, Volume XI:
 Leprosy in Iceland, page 168.
 Leprosy in Spain, Denia, page 1019.
- Public Health Reports, 1897, Volume XII, page 686:
 Proposed leprosy conference, Berlin.
- Public Health Reports, 1897, Volume XII:
 Leprosy in Matanzas, Cuba, page 1385.
 Leprosy in Brazil, Rio de Janeiro, pages 358 and 1026.
 Leprosy in Spain, page 1064.
- Public Health Reports, 1898, Volume XIII:
 Leprosy in Japan, page 210.
 Leprosy in Brazil, page 1257.
 Leprosy in Denmark, Iceland, and West Indies, page 373.
 Leprosy in Germany, Hamburg, page 1081.
- Public Health Reports, 1899, Volume XIV:
 Leprosy commission to investigate leprosy, page 305.
 Leprosy in Cuba, Matanzas, page 925.
 Leprosy in Cuba, Nuevitas and Puerto Principe, page 2098.
 Leprosy in Cuba, Santiago, pages 1698 and 1867.
 Leprosy in Porto Rico, page 284.
 Leprosy in Brazil, Rio de Janeiro, page 1857.
 Leprosy in Gulf quarantine station steamship *Lombard*, page 987.
 Leprosy in Texas, Eagle Pass, page 988.
 Leprosy in Panama, page 299.
 Leprosy in Colombia, La Boga, page 299.

BIBLIOGRAPHY OF LEPROSY AS FOUND IN ANNUAL REPORTS, MARINE-HOSPITAL SERVICE.

- Annual Report, 1875, page 159:
 Leprosy, relation of, to syphilis.
- Annual Report, 1889, page 10:
 Leprosy, resolution relative to, by American Public Health Association.

Annual Report, 1890, page 11:

Circular—Regulation to prevent the introduction of leprosy.

Annual Report, 1891, page 89:

Correspondence regarding the segregation of lepers in the United States.

Annual Report, 1891, page 15:

Leprosy.

Annual Report 1894, pages 348-350:

National control of leprosy.

Annual Report, 1895, page 456:

Report of Supervising Surgeon-General.

Annual Report, 1896, page 245:

A case of leprosy of Norwegian origin.

Annual Report, 1897, page 25:

Report of international leprosy conference held at Berlin.

Annual Report, 1897, page 426:

Leprosy.

Annual Report, 1898, pages 643-648:

Leprosy, statistics of, in Japan: laws relative to, in Denmark; bill for investigating, in United States.

MORTALITY STATISTICS (CITIES OF THE UNITED STATES), CALENDAR YEAR 1898.

More than 3,700 circular letters (as described in previous reports) were sent to the health officials of cities of the United States having a population of 1,000 or more. One thousand four hundred and thirty-three replies were received, and from these replies the mortality statistics were calculated as shown in the table below, which indicates the total mortality of each city and town and the rate per thousand from phthisis pulmonalis, smallpox, enteric fever, typhus fever, measles, scarlet fever, diphtheria (including membranous croup), and whooping cough. For the reasons given in the report of 1898, namely, the inaccuracies which would inevitably result from making an estimate on the census population of 1890, now nearly nine years old, only the estimated population is used in making these calculations—the estimate having been made by officials connected with the health departments of the different cities and towns. The total number of deaths reported was 320,385 among an estimated population of 21,035,689, this number corresponding to an annual mortality rate of 15.23 per 1,000 of the population reporting.

The following is the table arranged alphabetically and by States:

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS OF THE UNITED STATES FOR
THE YEAR ENDED DECEMBER 31, 1898.

[Compiled from answers received to 3,700 circular letters sent to cities of the United States having a population of 1,000 or more.]

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Alabama:											
Bessemer	100	4,544	10,000	10.00							
Greenville	24	2,806	3,000	8.00	1	2				1	
Huntsville	210	7,995	12,000	17.50	11	4	1	1		2	
Jacksonville	14	1,237	1,300	10.77	1						
Mobile	859	31,076	37,817	22.71	135	23				6	1
Oxford	17	1,473	1,500	11.33	2	1					
Troy	46	3,449	4,000	11.50	4	8				1	
Total	1,270		69,617	18.24	153	1	38	1	1	10	1
Alaska:											
Juneau	29		2,500		2					3	
Total	29		2,500	11.60	2					3	
Arizona:											
Bisbee	46	1,535	4,500	10.22	2	6				2	
Tucson	219	5,150	10,000	21.90	48	5	1	6	5	3	
Total	265		14,500	18.28	50	1	11	1	6	7	
Arkansas											
Camden	52	2,571	3,500	14.86	5			1			
Heleua	173	5,189	5,500	13.09							
Little Rock	643	25,874	40,000	15.33	95	1	25	2	2	5	10
Pine Bluff	151	9,962	15,000	10.06	1	5			1	4	2
Rogers	8	1,265	2,800	2.86	2	3		2		1	
Searcy	38	1,203	3,500	10.86							
Total	965		70,300	13.73	103	1	33	5	3	10	12
California:											
Alameda	209	11,165	16,000	13.06							
Anaheim	29	1,273	1,600	12.50	5	3					1
Auburn	43	1,595	2,100	20.43	10	2					
Bakersfield	173	2,626	10,000	17.30							
Colton	26	1,315	2,000	13.00	6						
Colusa	22	1,336	2,000	11.00	2	2			2		
Eureka	106	4,585	8,000	13.25	14						2
Gilroy	29	1,694	1,900	10.53	4	1			1	1	
Lodi	20	1,013	1,200	16.67	2	1				1	
Los Angeles	1,601	50,395	103,000	15.54	304	44	1	1	28	2	
Merced	29	2,009	2,000	10.00	5						
Monterey	10	1,662	1,000	10.00	4					3	
National City	21	1,353	3,000	7.00	4	1				1	
Oakland	908	48,682	75,000	12.11	114	10			1	23	
Pacific Grove	5	1,336	1,500	3.33							
Placerville	10	1,690	2,500	4.00	3						
Pomona	128	4,634	8,000	16.00	30	3			1	4	5
Redding	46	1,821	3,500	13.14	1	3					
Redlands	63	1,904	5,000	12.60	28	1				1	1
Riverside	93	4,683	8,000	11.63	19						
Sacramento	490	26,386	30,000	16.33	63	25				12	
San Bernardino	119	4,012	9,000	13.22	25					3	2
San Diego	182	16,159	22,000	8.27	23				1		
San Francisco	6,988	298,997	360,000	19.41	1,006	137	35	12	148	45	
San Jose	259	18,060	25,000	10.36	43	2				2	
San Pedro	15	1,240	1,500	10.00						1	
San Rafael	41	3,290	3,800	10.71	10						
Santa Ana	149	3,628	10,000	14.90	33	5			1	3	
Santa Barbara	93	5,864	7,200	12.92	16						4

¹ White, 13; colored, 60.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
California—Cont'd.											
Santa Clara.....	60	2,891	3,000	20.00	7						
Santa Cruz.....	160	5,596	9,000	17.78	11		1			1	
Santa Monica.....	57	1,580	3,000	19.00	7						1
Sausalito.....	7	1,334	1,200	5.83							
Stockton.....	206	14,424	18,000	11.44	40		7			3	
Willows.....	12	1,176	1,500	8.00	2						
Total.....	12,382		761,500	16.26	1,841	3	245	36	20	235	63
Colorado:											
Canyon City.....	49	2,825	6,000	8.17	12		4		1		1
Colorado Springs.....	246	11,140	25,000	9.84	65		5		2	2	1
Georgetown.....	25	1,927	2,000	12.50	5					1	
Golden City.....	49	2,383	2,500	19.60							
Greely.....	40	2,395	3,500	11.43	6		1			1	
Pueblo.....	456	24,558	40,000	11.40	51	4	10		6	12	
Rico.....	6	1,134	1,200	5.00							
Total.....	871		80,200	10.86	139	4	20		9	16	2
Connecticut:											
Ansonia.....	200	10,342	13,000	15.38	12		2		3	1	
Bethel.....	57	3,401	3,660	15.83	4					2	
Bridgeport.....	1,077	48,866	65,000	16.57	126		5			30	1
Brooklyn.....	32	2,628	2,628	12.17	2					1	
Burlington.....	19	1,302	1,200	15.83							2
Canton.....	46	2,500	2,500	18.40	10					1	
Chester.....	19	1,301	1,300	14.61							
Colchester.....	32	2,988	2,500	12.80	8		1				
Coventry.....	30	1,875	1,800	16.67	2						
Danbury.....	333	16,552	20,000	16.65	29		1	1		14	3
Darien.....	30	2,276	2,500	12.00	2						
East Haddam.....	50	2,599	2,500	20.00							
East Windsor.....	34	2,890	2,800	12.15	3						
Fairfield.....	62	3,868	4,000	15.15	4					1	1
Griswold.....	66	3,113	4,000	16.50	9		1			1	2
Guilford.....	55	2,780	2,800	19.64	4			2			
Haddam.....	27	2,059	2,500	10.80			1				
Hebron.....	13	1,039	1,000	10.00	3		1				
Lebanon.....	31	1,670	1,600	19.38	5						1
Litchfield.....	40	3,304	3,400	11.77	8		2				2
Mansfield.....	35	1,911	1,900	18.42							
Milford.....	81	3,811	4,000	20.24	4		1				
Naugatuck.....	158	6,218	10,000	15.80	16		1		1	5	5
New Britain.....	368	16,519	26,000	14.15	40		7	5	2	15	1
New Hartford.....	56	3,160	3,160	17.72	8		1			2	
New Milford.....	55	3,917	4,025	13.66	4					1	
Norfolk.....	21	1,546	1,600	13.13	2						
North Stonington.....	29	1,463	1,300	22.13	3					2	
Old Lyme.....	13	1,319	1,350	9.63							
Old Saybrook.....	22	1,484	1,500	14.67			1				
Orange.....	104	4,537	6,000	17.33	7		1	4			3
Rocky Hill.....	20	1,069	1,100	18.18	2					1	
Seymour.....	54	3,300	3,500	15.43							
Simsbury.....	30	1,874	2,000	15.00							
Southbury.....	22	1,089	1,150	19.13			1		1		
South Windsor.....	16	1,736	1,700	9.41	1						
Sterling.....	16	1,051	1,100	14.51	1		1				
Stonington.....	111	7,184	7,500	14.80	3		1			1	2
Stratford.....	63	2,608	3,400	18.53	10			1			2
Suffield.....	48	3,169	3,200	15.00	4						
Trumbull.....	17	1,453	1,500	11.33							
Watertown.....	28	2,323	2,800	10.00	6		1				
Westport.....	58	3,715	4,000	14.50	11						
Winchester.....	91	6,183	8,000	11.38	12						
Windsor Locks.....	64	2,758	3,000	21.33	2						
Total.....	3,788		235,413	16.07	366		30	14	7	79	25

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Delaware:											
Wilmington	1,379	61,431	73,000	18.89	113	—	29	9	2	76	10
Milton	2	1,074	1,200	1.67	—	—	—	—	—	—	—
Total	1,381	—	74,200	18.61	113	—	29	9	2	76	10
District of Columbia:											
Washington	5,813	230,392	280,250	20.74	635	—	182	18	18	203	21
Florida:											
Apalachicola	52	2,727	4,000	13.00	3	—	—	1	—	1	—
Ocala	70	2,904	5,000	14.00	—	—	—	—	—	—	—
Warrington	22	1,301	1,260	17.46	—	—	—	—	—	—	—
Total	144	—	10,260	14.04	3	—	—	1	—	1	—
Georgia:											
Cedartown	12	1,625	4,000	3.00	4	—	1	—	—	—	—
Columbus	¹ 294	17,303	² 19,303	³ 15.54	44	—	5	—	—	1	7
Dawson	29	2,284	3,000	9.67	—	—	—	—	—	1	—
Fort Gaines	26	1,067	2,000	14.00	—	—	—	—	2	1	—
Hawkinsville	26	1,755	2,500	10.40	6	—	1	—	—	1	—
Lithonia	25	1,182	2,500	10.00	1	—	—	—	—	1	—
Macon	439	22,746	28,000	15.68	⁴ 60	3	7	—	—	2	1
Madison	⁵ 28	2,131	3,000	9.33	2	—	—	—	—	—	—
Marshallville	26	1,086	1,100	23.61	—	—	—	—	—	—	—
Newnan	82	2,859	5,000	16.40	10	—	3	—	—	5	—
Tallapoosa	18	1,699	2,500	7.20	1	—	—	—	—	1	—
Thomasville	⁶ 102	5,514	6,000	17.00	11	—	5	—	—	4	—
Waycross	30	3,364	6,000	5.00	7	—	2	—	—	1	—
Total	1,139	—	84,903	13.42	146	3	24	—	2	18	8
Illinois:											
Alamont	12	1,044	2,000	6.00	4	—	4	—	—	4	—
Arcola	44	1,733	2,000	22.00	—	—	—	—	—	1	—
Arlington Heights	8	1,424	1,600	5.00	2	—	—	—	—	1	1
Astoria	8	1,357	2,000	4.00	—	—	—	—	—	—	—
Atlanta	16	1,178	1,200	13.33	3	—	—	—	—	—	—
Aurora	272	19,688	28,000	9.71	33	—	5	—	2	23	4
Beardstown	188	4,226	6,000	31.33	10	—	4	9	—	9	—
Bellville	248	15,361	20,000	12.40	25	—	27	—	—	13	—
Bement	26	1,129	1,500	17.33	3	—	2	—	—	5	—
Bunker Hill	18	1,269	1,300	13.85	1	—	—	—	—	1	—
Cable	3	1,276	1,000	3.00	—	—	—	—	—	1	—
Cairo	236	10,324	16,820	14.03	5	—	—	4	—	5	3
Carlyle	40	1,784	2,700	14.81	—	—	6	—	—	—	—
Carthage	25	1,654	2,500	10.00	—	—	—	—	—	—	—
Centralia	95	4,763	7,000	13.57	28	—	6	—	—	—	—
Chicago	22,493	1,099,850	1,619,226	14.08	2,416	636	55	67	680	208	—
Cicero	184	—	25,000	7.36	10	—	5	1	—	5	1
Colchester	24	1,643	1,700	14.12	3	—	2	—	—	—	—
Columbia	39	1,267	1,350	28.88	—	—	—	—	—	—	—
Cuba	9	1,114	1,200	7.80	2	—	—	—	—	5	—
Decatur	245	16,841	27,300	8.97	41	—	5	—	2	1	2
Delevan	16	1,176	2,000	8.00	2	—	—	—	—	1	—
Elgin	228	17,823	22,000	10.37	3	—	5	—	1	4	—
Fairfield	20	1,881	3,000	6.67	5	—	1	—	—	4	2
Galesburg	180	15,264	22,000	8.18	20	—	1	—	—	1	1
Germantown	⁷ 21	1,178	2,000	10.50	3	—	3	1	—	7	5
Griggsville	21	1,400	2,500	8.40	2	—	—	—	—	1	—
Harvard	67	1,967	5,000	13.40	—	—	—	—	—	—	—
Henry	23	1,512	2,000	11.50	—	—	1	—	—	—	—
Kansas	17	1,087	2,100	8.14	2	—	2	1	—	1	—
Keithsburg	20	1,484	2,500	8.00	—	—	—	—	2	4	—
Kewaunee	154	1,216	12,000	12.83	5	—	2	—	—	5	2

¹ White, 111; colored, 183.² White, 10,276; colored, 9,027.³ White, 10,80; colored, 20,27.⁴ White, 14; colored, 46.⁷ Typhus, 2.⁵ White, 11; colored, 17.⁶ White, 47; colored, 53.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Illinois—Continued.											
Kilmundy	14	1,045	1,400	10.00	—	—	—	—	—	—	—
Lebanon	42	1,636	1,800	23.33	2	—	—	—	—	—	2
Leroy	16	1,258	1,600	10.00	—	—	—	—	—	—	—
Lexington	30	1,187	1,500	20.00	3	—	—	1	—	—	—
Lincoln	116	6,725	10,000	11.60	5	—	2	1	—	2	—
Marengo	65	1,445	1,800	35.50	—	—	—	—	—	—	—
Mattoon	95	6,833	10,200	9.32	5	—	3	1	—	5	1
Minonk	53	2,316	2,500	15.14	—	—	—	1	—	4	—
Moline	200	12,000	20,000	10.00	4	—	6	—	—	—	—
Monmouth	91	5,936	10,000	9.10	6	—	5	1	—	1	1
Morgan	21	1,027	2,500	8.40	7	—	—	—	—	—	—
Morrison	30	2,088	2,500	12.00	1	—	2	—	—	—	—
Mount Carmel	37	3,376	4,500	8.22	3	—	3	—	—	1	—
Nanvoo	14	1,208	1,500	9.33	—	—	—	—	—	—	—
North Peoria	10	1,086	2,500	4.00	1	—	1	—	—	—	—
Ottawa	118	9,985	12,000	9.83	19	—	3	—	—	1	—
Peoria	643	41,024	70,259	9.15	50	—	11	—	4	19	2
Quincy	522	31,494	42,000	12.33	51	—	8	1	5	3	2
Riverton	12	1,127	1,600	7.50	2	—	—	—	—	1	—
Rockford	272	23,584	35,000	8.24	39	—	1	—	—	23	—
Rushville	25	2,031	2,500	10.00	3	—	1	1	—	—	1
Sumner	26	1,037	1,700	15.29	4	—	—	—	—	—	2
Taylorville	40	2,829	6,000	6.67	1	—	2	—	—	2	—
Vermont	30	1,185	1,200	25.00	1	—	1	—	—	1	—
Total	26,722	—	2,096,055	12.75	2,839	—	783	78	84	835	240
Indiana:											
Anderson	97	10,741	21,000	4.62	12	—	5	—	1	6	—
Batesville	15	1,169	2,300	6.52	3	—	—	—	—	—	—
Bedford	31	3,351	5,000	6.20	—	—	2	—	—	—	—
Bluffton	28	3,589	5,000	5.60	2	—	1	—	1	—	—
Bourbon	31	1,064	2,500	11.97	2	—	5	2	5	2	2
Brookville	26	2,028	2,300	11.30	5	—	—	—	—	—	—
Brownstown	7	1,422	1,600	4.38	1	—	—	—	—	—	—
Cambridge	14	1,782	2,000	7.00	5	—	—	—	—	—	—
Capnelton	33	1,991	2,500	13.20	2	—	2	—	—	1	—
Clay	50	1,004	2,000	25.00	10	—	15	8	5	2	10
Columbus	117	6,719	10,000	11.70	18	—	2	2	—	2	3
Connorsville	52	4,548	7,000	6.06	13	—	1	2	—	—	—
Covington	26	1,891	2,100	12.38	4	—	2	—	—	5	—
Danville	15	1,569	3,000	5.00	1	—	1	—	—	—	—
Edinburg	15	2,631	2,000	7.50	1	—	2	—	—	1	—
Elkhart	126	11,360	15,000	8.40	16	—	7	1	—	—	3
Elwood	60	2,284	14,000	4.22	2	—	1	—	—	6	—
Evansville	739	50,756	70,000	10.56	119	—	11	—	3	8	11
Fort Wayne	609	35,363	50,000	12.18	73	—	10	2	1	20	—
Fowler	12	1,285	1,600	7.50	—	—	1	—	—	—	—
Frankfort	85	5,919	7,500	11.33	12	—	—	—	—	2	1
Franklin	50	3,781	4,500	11.11	—	—	—	—	—	1	—
Greencastle	37	4,390	4,300	8.43	6	—	1	—	—	—	—
Greenfield	18	3,100	5,500	3.27	2	—	6	1	3	3	3
Greensburg	48	3,596	5,000	9.60	6	—	2	—	—	4	—
Hammond	129	5,428	17,000	7.59	19	—	5	1	—	3	—
Hope	17	1,009	1,500	11.33	—	—	—	—	—	1	—
Indianapolis	2,251	105,436	200,000	11.26	282	—	48	2	12	32	9
Jasper	8	1,281	2,000	4.00	2	—	2	—	—	—	—
Knightstown	69	1,867	2,000	34.50	15	—	—	—	—	—	—
Kokomo	34	8,261	11,000	3.09	—	—	1	—	—	2	—
Ligonier	7	2,195	2,500	2.80	—	—	—	—	—	—	—
Marion	107	8,769	22,000	5.87	10	—	9	—	2	16	—
Michigan City	155	10,776	15,000	10.33	9	—	1	—	1	5	2
Munice	225	11,345	27,000	8.33	36	—	9	—	—	9	3
New Castle	25	2,697	3,500	7.14	4	—	2	—	—	—	—
New Harmony	20	1,197	1,500	13.33	3	—	—	1	—	—	—
Noblesville	30	1,054	6,000	5.00	3	—	3	—	—	—	—
North Vernon	41	2,012	3,000	13.67	9	—	1	—	—	1	—
Oakland	28	1,524	2,000	14.00	1	—	2	—	—	—	—
Plymouth	28	2,723	4,000	7.00	4	—	—	—	—	1	—

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phtisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Indiana—Cont'd.											
Princeton	216	3,076	30,000	7.20	39		10		1	3	
Rensselaer	21	1,455	2,500	8.40							
Risingsun	18	1,689	1,800	10.00	8		1				
Rochester	20	2,467	4,000	5.00	3				1		
Rockport	76	2,314	26,000	2.92	34		32	1	2	13	4
Rushville	38	3,475	5,000	7.60	8		1				
Spencer	21	1,868	2,500	8.40	1		1				
Tipton	22	2,697	4,500	4.89	6		2			5	
Vevay	20	1,663	2,000	10.00	3		1				
Warren	5	1,129	2,000	2.50	3						
Washington	88	6,064	10,600	8.80	2		10			10	1
Williamsport	16	1,027	1,800	8.89	3						
Winamac	60	1,215	25,000	2.40	4		10	1			
Total	6,136		484,980	12.65	821		218	22	38	140	53
Iowa:											
Afton	15	1,045	1,200	12.50				2			
Algona	16	2,068	3,000	5.33			1				
Atlantic	21	4,351	5,000	4.20	3		4				
Audubon	9	1,301	2,000	4.50						4	
Belleplaine	26	2,623	3,300	7.88	4						
Bellvue	16	1,394	1,600	10.00							
Burlington	323	22,565	30,000	10.77	48		4	2	3	5	
Cedar Rapids	142	18,020	27,000	5.26	25		10				2
Cherokee	35	3,441	4,000	8.75							
Clinton	240	13,619	28,000	8.57	5		2			1	
Dunlap	11	1,088	1,500	7.33							
Fairfield	41	3,391	4,500	9.11	3		1				
Farmington	15	1,002	1,500	10.00	1					1	
Glenwood	14	1,890	2,143	6.53							
Grinnell	32	3,332	4,000	8.00	2						
Grundy Center	11	1,161	1,800	6.11							
Hamburg	9	1,634	2,000	4.50							
Humboldt	18	1,075	1,000	18.00	2						
Ida Grove	24	1,563	2,000	12.00			1				
Lake City	14	1,160	2,800	5.00							
Lansing	23	1,668	1,750	13.14	3						
Laporte	15	1,052	1,500	10.00			1				
Lisbon	11	1,079	1,200	9.17	1						1
Marion	37	3,094	5,070	7.30	6		4				
Mount Ayr	5	1,265	1,700	2.94					1		
Mount Vernon	14	1,259	1,500	9.33							
Muscataine	220	11,454	14,000	17.71	13		33			5	
Nevada	21	1,662	2,500	8.40	1						
Osage	30	1,913	3,200	9.99	1		1				
Ottumwa	200	14,001	19,000	10.53	17		3	1		8	1
Perry	27	2,880	4,500	6.00	2						
Sanborn	5	1,075	1,450	3.45				2			
Shenandoah	38	2,440	3,500	10.86	3				1	1	
Sibley	12	1,090	1,400	8.57			2				
Traer	9	1,014	1,300	6.92	1					1	
Villisca	25	1,744	2,500	10.00	2		1			1	
West Liberty	13	1,268	1,800	7.22	3						
What Cheer	25	3,246	3,300	7.58	1					1	
Total	1,762		199,513	8.83	147		58	7	5	27	4
Kansas:											
Atchison	233	13,963	20,000	11.65	24		4		1	15	8
Augusta	8	1,943	1,300	6.15	1					1	
Cherryvale	15	2,104	3,000	5.00	3		1				
Ellis	8	1,107	1,050	7.62						1	
Eureka	243	2,257	17,000	14.29							
Fredonia	24	1,515	1,700	14.12	3		3				
Herington	15	1,353	1,600	9.38			1			1	
Larned	7	1,861	2,000	3.50	1			1			
Leavenworth	325	19,768	21,000	15.48	44		3		2	8	2

¹ Typhus, 1.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Kansas—Cont'd.											
Marysville.....	28	1,913	3,000	9.33	5	—	—	—	—	—	—
Medicine Lodge.....	58	1,095	5,000	11.60	4	—	—	—	—	—	—
Minneapolis.....	81	1,756	11,200	7.23	6	—	1	—	2	3	—
Norton.....	35	1,074	10,000	3.50	—	—	—	—	—	—	—
Osage.....	40	3,469	3,700	10.81	10	—	2	—	—	—	—
Ottawa.....	43	6,248	8,000	5.38	5	—	3	—	—	—	—
Pratt.....	52	1,418	6,000	8.67	8	—	—	—	—	1	—
Weir.....	46	2,138	4,000	11.50	4	—	2	3	—	6	11
Yates Center.....	79	1,305	9,380	8.42	—	—	2	3	—	1	10
Total.....	1,340	—	128,930	10.39	118	—	28	7	5	41	31
Kentucky:											
Bellevue.....	65	3,163	6,500	10.00	1	—	3	—	—	1	—
Bowling Green.....	27	7,803	3,000	9.00	3	—	—	—	—	2	—
Cloverport.....	23	1,527	1,500	15.33	9	—	1	1	1	2	—
Covington.....	762	37,371	50,000	15.24	96	—	12	—	2	16	—
Cynthiana.....	40	3,016	4,000	10.00	10	—	3	—	—	2	—
Eminence.....	12	1,002	2,000	6.00	4	—	—	—	—	1	—
Glasgow.....	25	2,051	2,000	12.50	10	—	4	—	10	1	—
Hickman.....	38	1,652	2,500	15.20	9	—	1	—	—	—	—
Louisville.....	3,058	161,129	225,000	16.73	317	—	118	1	2	19	27
Middleboro.....	40	3,271	4,500	8.89	4	—	3	—	—	3	1
Nicholasville.....	36	2,157	3,400	10.59	24	—	6	—	—	3	—
Williamsburg.....	10	1,376	2,500	4.00	3	—	4	—	—	3	—
Total.....	4,136	—	306,900	13.48	490	—	155	2	15	70	30
Louisiana:											
Amite.....	16	1,510	2,000	8.00	—	—	—	—	—	—	—
Baton Rouge.....	230	10,478	13,000	17.69	30	—	4	—	1	—	5
Gretna.....	45	3,332	3,000	15.00	13	—	2	—	—	1	—
Homer.....	10	1,132	1,200	8.33	1	—	2	—	—	1	—
McDonoughville.....	25	2,235	1,500	16.67	7	—	—	—	—	1	—
Morgan.....	23	2,291	2,800	8.21	4	—	—	—	—	—	—
New Orleans.....	6,826	242,039	275,000	26.91	853	—	184	—	1	19	45
Shreveport.....	319	11,979	22,600	15.10	44	—	72	—	—	—	89
Total.....	7,494	—	320,500	23.38	952	—	194	—	2	22	59
Maine:											
Addison.....	13	1,022	1,000	13.00	—	—	—	—	—	—	—
Albion.....	9	1,042	1,150	7.83	—	—	—	—	—	—	—
Alfred.....	23	1,030	1,000	23.00	1	—	—	—	—	2	—
Anson.....	29	1,444	1,400	20.34	3	—	—	—	—	—	—
Appleton.....	12	1,080	1,080	11.11	—	—	—	—	—	—	—
Athens.....	16	1,072	1,000	10.00	1	—	—	—	—	—	—
Auburn.....	176	11,250	12,000	14.67	5	—	1	—	—	6	—
Bath.....	165	8,723	10,000	16.50	17	—	1	—	2	1	—
Biddeford.....	353	14,443	16,000	22.02	18	—	7	—	3	14	—
Boothbay.....	26	1,718	1,750	14.86	1	—	1	—	—	—	—
Boothbay Harbor.....	24	1,699	2,300	10.43	5	—	1	—	—	—	—
Bowdoinham.....	28	1,508	1,600	17.50	6	—	—	—	—	—	—
Bradford.....	30	1,215	1,100	27.27	—	—	—	—	—	—	—
Bristol.....	39	2,821	3,000	13.00	—	—	—	—	—	—	—
Brooklin.....	27	1,046	1,046	25.81	—	—	—	—	—	—	—
Brownville.....	14	1,074	1,074	13.03	4	—	2	—	—	1	2
Calais.....	121	7,290	8,000	15.13	1	—	—	—	—	—	—
Canton.....	16	1,303	1,200	13.33	—	—	—	2	—	—	—
Carmel.....	17	1,066	1,066	15.95	2	—	—	—	—	—	—
Chelsea.....	25	2,356	2,500	10.00	2	—	—	—	—	—	—
China.....	35	1,423	1,400	25.00	1	—	—	—	1	—	—
Corinna.....	23	1,207	1,200	19.17	2	—	—	—	—	—	—

¹ White, 11.85; colored, 21.62.² White, 21.93; colored, 31.89.³ White, 102; colored, 217.⁴ White, 12,000; colored, 10,000.⁵ White, 8.50; colored, 21.70.⁶ White, 10; colored, 34.⁷ White, 1; colored, 1.⁸ White, 1; colored, 8.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Maine—Continued.											
Corinth	20	1,154	1,500	13.33	4						
Cornish	17	1,118	1,000	17.00	3						
Cumberland	15	1,487	1,500	10.00							
Dexter	49	2,732	3,000	16.33	2		1				
Dresden	8	1,043	1,040	7.69	1						
Durham	16	1,111	1,100	14.55	1						
East Livermore	38	1,506	2,000	19.00	6		2				
Eastport	80	4,908	5,000	16.00	9		4			4	
Ellsworth	63	4,804	5,000	12.60	9		3				
Farmington	83	3,207	3,207	25.88	1		3				
Fort Kent	35	1,826	2,200	15.91	1					4	
Frenchville	110	2,560	4,000	27.50	2					3	
Fryeburg	18	1,418	1,400	12.86	1						
Gorham	61	2,888	4,000	15.25	8		2				
Gouldsboro	17	1,709	1,350	12.59							
Hancock	11	1,190	1,163	9.46			1				
Harrington	17	1,150	1,200	14.17			1				
Harrison	15	1,070	1,071	14.01							
Hiram	18	1,063	1,063	16.93							
Islesboro	10	1,006	1,006	9.05				1			
Kittery	48	2,864	3,500	13.71	1						
Lebanon	18	1,263	1,200	15.00	2		2				
Limington	11	1,902	1,000	11.00	1						
Litchfield	19	1,126	1,126	16.88			2				
Machiasport	13	1,437	1,427	9.11			2				
Madawaska	128	1,451	1,500	18.67			2			8	
Madison	33	1,815	2,000	16.55			4			1	
Millbridge	24	1,963	2,000	12.00	4						
Milo	21	1,029	1,200	17.50							
Monmouth	25	1,362	1,300	19.23	2					2	
Monroe	18	1,079	1,080	16.67							
Monticello	13	1,132	1,138	11.42	2						
New Gloucester	12	1,294	1,200	10.00	1						
Newport	38	1,188	1,500	25.33	9		1				
New Sharon	23	1,064	1,150	20.00							
Norridgewock	24	1,656	1,656	14.49	1		1				
North Berwick	33	1,803	1,800	18.33			1		1	3	
Norway	54	2,665	2,185	20.14	5		2				
Oldtown	2100	5,312	6,000	16.67	2		5	7	2	1	1
Palmyra	9	1,004	1,050	8.57							
Pembroke	33	1,514	1,514	21.79	7		1				
Phippsburg	21	1,396	1,400	15.00							
Portland	834	36,425	41,500	20.09	84		35	2	4	29	12
Readfield	15	1,176	1,260	11.11							
Saco	104	6,075	6,500	16.00	6		3		1	1	
St. Albans	12	1,206	1,206	9.95	3						
St. George	47	2,491	2,400	19.58	3						
Sanford	72	4,201	6,000	12.00	6		1			1	
Sedgewick	10	1,012	1,000	10.00						2	
Sidney	16	1,334	1,200	13.33	4						
Skowhegan	90	5,068	5,000	18.00	9						
South Berwick	50	3,434	4,400	11.36	4		2			1	
Sullivan	20	1,379	1,300	15.38	4						
Thomaston	50	3,009	3,000	16.62	5					7	
Topsham	15	1,394	1,600	9.31			5			3	
Vassalboro	34	2,052	2,000	17.00							
Vinal Haven	26	2,617	2,600	10.00	7						
Waldoboro	62	3,505	3,000	20.66	2						
Washburn	12	1,097	1,100	10.91	1						
Washington	24	1,230	1,211	11.36	6						
Waterville	170	7,107	10,000	17.00	23		3		2		
Westbrook	129	6,632	7,000	18.42	2						
Windham	42	2,216	2,210	19.00	2		1	1			
Winslow	41	1,814	2,000	20.25	1					1	
Yarmouth	42	2,098	2,200	19.09	2						
Total	4,451		262,308	16.99	326		99	15	17	95	15

¹ Typhus.² Typhus, 4.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Maryland:											
Baltimore	10,385		541,000		1,112		189	48	46	412	64
Cambridge	75	4,192	6,000	12.50	4		7	1	2	1	1
Catonsville	23	2,115	3,000	13.04	2		2			1	
Centerville	31	1,309	2,000	15.50					1	3	
Easton	25	2,939	4,000	6.25	12		8		1	1	3
Elkton	49	2,318	2,600	18.84	7		1	3			1
Frederick	153	8,193	9,000	17.00							
Frostburg	55	3,804	7,000	7.86	3					2	
Havre de Grace	42	3,244	3,500	12.00	4		3			1	
Sparrow Point	17	2,507	2,650	6.41	2					1	
Total	10,755		580,750	18.52	1,146		210	52	50	421	69
Massachusetts:											
Acushnet	28	1,027	1,050	27.67	1						
Agawam	40	2,352	2,450	15.51	4		1				
Amesbury	133	9,798	10,000	13.30						2	
Amherst	75	4,512	4,785	15.68	10						
Arlington	105	5,629	7,700	13.64	4		1			2	
Ashburnham	26	2,074	2,000	13.00							
Ashfield	17	1,025	1,000	17.00	1						
Auburn	32	1,532	1,300	24.62			1			1	
Avon	26	1,384	1,625	16.00			1				
Barre	44	2,239	2,278	19.32	2		1				
Bedford	15	1,092	1,200	12.50							
Belchertown	37	2,120	2,200	16.82	3					1	
Bellingham	20	1,334	1,500	12.50							
Belmont	47	2,098	3,500	13.43	5						
Beverly	204	10,821	13,000	15.69	25		4		1	2	1
Billerica	40	2,380	2,700	14.81	6						
Boston	10,886	448,477	541,827	20.09	1,241		185	27	33	185	68
Bourne	31	1,442	1,585	19.57							
Braintree	79	4,848	5,000	15.40			3			1	
Bridgewater	66	4,249	4,650	14.19	4						1
Brockton	458	27,294	37,278	12.28	66		4		1	2	1
Brookfield	57	3,352	3,552	17.00	4					1	
Brookline	251	12,103	18,500	13.03	17		2	2	2	3	11
Buckland	36	1,570	1,800	20.00						1	
Cambridge	1,542	70,628	89,724	17.18	187		14	1	6	29	22
Chatham	44	1,954	1,800	24.44	4						
Chelsea	634	27,409	33,468	18.94	29		7		1	3	6
Chicopee	368	14,050	19,000	18.95	34		4			5	2
Clinton	180	10,424	12,000	15.00	18		9			4	
Colerain	21	1,671	1,700	12.35	1				5		
Concord	62	4,427	5,700	10.53	6		2				
Cottage City	16	1,080	1,080	14.81			1				1
Dalton	65	2,885	3,364	19.35			5				
Danvers	105	7,454	8,000	12.06	15		1			1	
Dehnam	117	7,123	7,200	16.24	18		1	1			1
Dighton	37	1,889	1,800	20.56	4					2	
Douglas	52	1,908	2,026	25.72	4				2		
Duxbury	34	1,908	1,966	17.29							
Easthampton	71	4,395	4,800	14.79	9						
Edgartown	21	1,156	1,150	18.17	1		1				
Essex	21	1,713	1,600	13.13							
Everett	325	11,068	22,500	14.44	44		5		1	8	1
Fall River	1,813	74,398	101,103	17.93	149		21	15	5	9	7
Falmouth	56	2,567	2,655	21.09	2						
Fitchburg	404	22,027	29,483	13.70	40		6		1	1	8
Foxboro	57	2,933	3,500	16.29	1						
Franklin	79	4,831	5,000	13.62	6		1				1
Freetown	27	1,417	1,400	19.29			1				
Georgetown	30	2,117	2,100	14.29	4						
Gloicester	372	24,651	30,500	12.20	40		2	2	2	5	7
Granville	21	1,061	1,000	21.00			2	1			
Great Barrington	58	4,612	5,000	11.60	3						
Greenfield	109	5,252	7,630	13.11	14		2	1			
Groton	31	2,057	2,200	14.09	1						
Groveland	39	2,191	2,333	16.72	3		1				

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Massachusetts—											
Continued.											
Hadley	29	1,669	1,704	17.02	1						
Hanson	30	1,095	1,400	25.86	5		3				
Harvard	30		1,160								
Hardwick	54		3,000		8						
Hatfield	19	1,264	1,262	15.06	1						
Haverhill	519	27,412	37,348	12.89	70		8	7		15	24
Hingham	94	4,564	4,600	20.43	5					3	
Holliston	58	2,619	2,700	21.48	9						
Holyoke	778	35,637	44,214	17.60	90		8	1	1	10	4
Hopkinton	51	4,088	2,983	17.09			1				
Hubbardston	26	1,946	1,274	20.41	2						
Hudson	75	4,670	5,562	13.48	14		2		1	1	
Huntington	27	1,385	1,450	18.61	5						
Ipswich	79	4,439	4,500	17.56							
Lawrence	1,057	44,654	58,500	18.07	23		11	1	9	4	1
Lee	67	7,385	4,000	14.25	5		1		2	1	2
Lenox	39	2,889	2,850	13.68	3		1				1
Leominster	154	7,269	10,000	15.40	16		3		1	1	3
Lexington	63	3,197	3,498	18.01	4						
Littleton	14	1,025	1,200	11.67							
Lowell	1,808	77,696	87,000	20.78	209		24		6	36	10
Lunenburg	22	1,146	1,264	17.66	3						
Malden	478	23,031	32,500	14.71	55		5		1	5	11
Manchester	37	1,789	1,876	14.39	1		1				
Marlboro	223	13,805	15,000	14.87	30						2
Mattapoisett	27	1,148	1,100	24.55							
Maynard	43	2,700	3,230	13.03	3						
Medfield	32	1,493	2,000	11.00	1						
Melford	197	11,079	17,000	11.59	14		3			3	1
Medway	62	2,985	3,000	20.67	2		2	1			
Methuen	105	4,814	7,000	15.00	6		4			9	
Middleboro	85	6,065	6,700	12.54	7						
Milford	157		9,780		29		3	1		2	
Millbury	82	4,428	5,222	15.70	10				1		
Milton	75	4,278	6,000	12.50							
Monson	62	3,650	3,746	16.55	6						5
Nantucket	52	3,268	3,000	16.67	4						
Needham	66	3,035	3,500	18.86			1	1	2	1	7
New Bedford	1,111	40,733	58,000	19.16	96		17		4	18	
Newburyport	254	13,947	14,915	17.03	20		2			3	2
New Marlboro	27	1,305	1,350	20.00	4		1				
Newton	450	24,379	27,590	16.36	27		7		4	6	6
North Adams	319	16,074	22,000	14.50	18		10		2	8	
Northampton	279	14,990	17,500	15.94	25		3			1	
North Andover	58	3,742	3,742	15.50	6		2	1			1
North Attleboro	91	6,727	7,000	13.00	7		1			1	
North Brookfield	86	3,871	4,600	18.69	13			1	4	6	1
Norton	20	1,785	1,700	11.76	3						
Orange	76	4,568	5,500	13.81	5					3	
Orleans	33		11,200								
Oxford	40	2,616	2,400	16.67	6					1	
Palmer	142	6,520	8,000	17.79	5		1		1		4
Peabody	1,230	10,518	11,000	20.91	22		3			18	1
Pembroke	24	1,320	1,223	19.62							
Pepperell	79	3,127	4,000	19.75	5					1	1
Pittsfield	353	17,281	20,461	17.25	35		8		1	2	1
Plymouth	167	7,314	8,000	20.88	8		4				
Provincetown	118	4,642	4,700	25.11	8		1		2		
Quincy	334	16,723	23,549	14.18	28		5			3	
Randolph	80	3,946	3,500	22.86	5		2			2	
Reading	74	4,088	5,717	12.94	5						
Rehoboth	23	1,786	1,800	12.78	1						
Revere	135	5,668	9,000	15.00	2					2	1
Royalston	25	1,030	1,000	25.00			2	3		3	
Salem	551	30,801	35,500	15.52	42		11			3	9
Salisbury	25	1,316	1,350	18.52	3						3
Seekonk	19	1,317	1,465	12.97	1				1		
Sharon	28	1,634	1,800	15.56	2		2			2	

¹ Typhus, 1.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Massachusetts—Continued.											
Shelburne	15	1,553	1,560	9.62	1						
Sherborn	24	1,381	1,446	16.60							
Shrewsbury	23	1,449	1,524	15.09	3						
Somerset	48	2,106	2,000	24.00	5						
Somerville	880	40,152	60,000	14.67	70		11			10	3
Southampton	26	1,017	1,054	24.60				1		1	1
Southboro'	28	2,114	2,200	12.73	3						
Springfield	991	44,179	56,501	17.54	108		15	1	1	29	9
Sterling	18	1,244	1,300	13.85	1						
Stockbridge	32	2,132	2,079	15.39	1						
Stoughton	107	4,852	5,272	19.40	15		1				
Sutton	62	3,180	3,420	18.13	1		2			1	
Swansea	25	1,456	1,650	15.15							
Taunton	558	25,448	28,167	19.81	66		8		1	1	
Tewksbury	39	2,515	2,500	10.40	2			1			
Tisbury	19	1,506	1,000	19.00							
Topsfield	14	1,022	1,030	13.59							
Townsend	27	1,750	1,800	15.00							
Upton	35	1,878	2,150	16.28	5						
Uxbridge	59	3,408	3,550	16.62	7						
Walpole	36	2,604	3,200	11.25	8						
Waltham	287	18,707	22,296	12.87	39		7		1	3	
Ware	135	7,329	7,651	17.64	9		1			2	
Warren	50	4,681	4,000	12.50	5				2		2
Watertown	122	7,073	8,500	14.35	12		2		5	2	
Webster	161	7,031	7,500	21.47	12		1	1	1	1	
Wellesley	39	3,600	4,225	9.23	4		1				
Westford	47	2,250	2,418	19.44	2		2				
Westminster	24	1,688	1,315	18.25	3						
West Newbury	45	1,796	1,643	27.39	5					1	
Weston	25	1,664	1,710	14.62	1		1			1	
Westport	54	2,599	2,600	20.77	1					1	
West Springfield	108	5,077	7,000	15.43				1	1	2	
Whitman	80	4,441	6,021	13.29	18		1				
Winchester	65	4,390	7,000	9.27	6			1			
Woburn	225	13,499	14,500	15.51	21		2			3	
Worcester	1,827	84,655	108,463	16.84	221		13		5	35	
Wrentham	42	2,566	2,900	14.48	3		1			1	1
Yarmouth	40	1,760	1,655	24.63	4		1				
Total	37,610		2,092,917	17.97	3,738		525	73	120	589	258
Michigan:											
Adrian	138	8,756	10,000	13.80	7		3				
Albion	54	3,763	5,000	10.80	1		1				1
Allegan	30	2,069	3,000	10.00	6						
Ann Arbor	187	9,431	16,000	11.69	28		2				
Bay City	280	27,839	34,000	8.24			4	2		1	4
Belding	26	1,730	3,006	8.65	2		1		1		
Benton Harbor	66	3,692	9,000	7.34	1		1		1	1	
Big Rapids	72	5,303	5,200	13.84	6		4				2
Blissfield	23	1,132	2,300	10.00	6		1				
Buchanan	6	1,994	2,200	17.27	2				1		
Cadillac	50	4,461	6,000	8.33	4				2		
Cassopolis	18	1,369	1,324	13.59	4						
Charlevoix	25	1,496	1,500	16.67							
Charlotte	51	3,867	4,300	11.86	8		2			1	
Cheboygan	63	6,235	7,000	9.00	6		4		4		
Chelsea	16	1,365	1,500	10.66	2						
Chesaning	26	1,056	2,000	13.00	3					1	
Decatur	14	1,109	1,200	7.00	1						
Detroit	4,241	205,876	300,000	14.14	432	1	57	1	14	87	34
Dundee	15	1,166	1,400	10.71							
East Tawas	20	2,200	2,700	7.41							
Escanada	156	6,808	8,000	19.58	20		4	3			9
Evart	11	1,269	1,600	6.88	1						
Fentonville	30	2,182	3,000	10.00	8						
Flint	135	9,803	12,000	11.25	13						
Frankfort	15	1,175	1,500	10.00	2						

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Popula- tion, United States cen- sus of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and mem- branous croup.	Whooping cough.
Michigan—Cont'd.											
Fremont	9	1,097	1,800	5.00	1		1				
Gladstone	20	1,337	2,150	9.30	2		2		1		1
Grand Haven	55	5,023	5,500	10.00	5		1			12	
Grand Rapids	988	60,278	90,000	10.98	111		18	1	2	14	
Harbor Springs	16	1,052	1,500	10.67	2		1			1	
Hastings	32	2,972	3,000	10.67			2				
Holland	64	3,945	9,000	7.11	6						
Howard	17	1,137	1,500	11.33	3						
Ithaca	12	1,627	2,000	6.00				1			
Jackson	332	20,798	30,000	11.07	30		2			4	3
Jonesville	15	1,288	1,500	10.00							
Kalkaska	12	1,161	1,400	8.57	1						
Lakeview	25	1,024	3,000	8.33	1						1
Lapeer	15	2,753	3,500	4.28	3					1	1
Luther	6	1,084	1,000	6.00	2					1	
Mancelona	11	1,205	1,400	7.86							
Manistiquie	59	2,940	4,500	13.11							
Marine	46	3,268	4,000	11.50	5		3			1	
Marquette	150	9,093	10,000	15.00							
Monroe	73	5,258	5,280	13.83	2						2
Mount Clemens	97	4,748	6,000	16.17	11		3			2	2
Mount Pleasant	20	2,701	3,500	5.71	2					1	
Niles	66	4,197	4,500	14.67	10		1	1		2	
Ovid	12	1,423	1,400	8.57							
Owosso	106	6,564	10,000	10.60	13		1			6	
Pawpaw	12	1,391	1,200	12.00							
Pentwater	12	1,510	1,800	6.67							
Petoskey	50	2,872	5,000	10.00	1		2	1	2		
Plainwell	9	1,414	1,400	6.43	2		2				
Plymouth	18	1,172	2,000	9.00	6		1				
Pontiac	150	6,200	9,000	16.67	4		2				
Port Huron	227	13,543	20,000	11.35	3		5		3	1	
Richmond	24	1,074	1,050	22.86	6		1			2	
Romeo	17	1,687	1,621	10.49	1						
St. Joseph	66	3,733	5,000	13.20	4		2				4
St. Louis	30	2,246	2,400	12.50	3						
Stanton	11	1,352	1,500	7.33							
Sturgis	40	2,489	2,800	11.28	4						
Tecumseh	38	2,310	2,500	15.20	2						1
Three Rivers	29	3,131	4,000	5.27	4						
Traverse	117	4,353	9,000	12.41	11		5	2	1	2	1
Whitehall	13	1,903	1,700	7.65	3						
Williamston	12	1,139	1,200	10.00			5	5	1	1	
Ypsilanti	87	6,129	7,000	12.43	7		1		1		
Total	8,988		732,331	12.27	805	1	135	17	34	142	66
Minnesota:											
Alexandria	32	2,118	2,800	11.43	6		3		1	1	
Anoka	48	4,252	4,000	12.00	4		1	2			
Austin	40	3,901	7,000	5.71	17		5	13	1	1	3
Barnesville	15	1,069	1,200	12.50	2						5
Blue Earth	12	1,569	3,000	4.00	1						
Cannon Falls	11	1,078	1,500	7.33						3	
Chatfield	26	1,335	1,500	17.33							
Cloquet	29	2,530	3,800	7.63	2		2				
Crystal	7	1,074	1,000	7.00						1	
Detroit	13	1,510	1,800	7.22	4					1	
Duluth	625	33,115	60,000	10.42	69		31	14	1	1	
Fairmount	15	1,205	2,800	5.36							
Faribault	108	6,520	10,000	10.80	3		3			9	
Fergus Falls	33	3,772	5,000	6.60	2		1		2		
Hastings	37	3,705	4,000	9.25	4						
Jordan	10	1,233	1,500	6.67	3					1	
Lesueur	13	1,763	2,350	5.53	3						
Littlefalls	62	2,354	7,000	8.86	10		3				
Luverne	17	1,466	2,000	8.50	4						
Mankato	115	8,838	12,000	9.58			3		2		

1 Typhus, 1.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					*Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Minnesota—Cont'd.											
Minneapolis	2,159	164,738	223,720	9.65	257	1	86	68	2	30	15
Montevideo	14	1,437	2,200	6.36	1		1	1			
Montgomery	14	1,086	1,000	14.00	2						
Moorhead	58	2,088	4,000	14.50	5		3	2		2	
Morris	16	1,266	1,800	8.89	4					1	
New Ulm	54	3,741	8,500	6.35	3		5				
Northfield	33	2,659	4,000	8.25	5						
North St. Paul	10	1,099	1,000	10.00							
Owatonna	47	3,849	6,500	7.23	2		1		1	1	
St. Paul	1,737	133,156	200,000	8.68	234	43	29		14	65	7
Red Wing	80	6,249	8,000	10.00	2		4				
Redwood Falls	14	1,238	2,000	7.00	1		1				
Sank Center	22	1,695	2,300	9.57	1		1			1	
Sank Rapids	16	1,185	1,500	10.67							
Shakopee	28	1,757	2,200	12.73	5						
South St. Paul	36	2,242	2,200	16.36	2			1		5	
Spring Valley	28	1,381	2,000	14.00	1		4				
Tracy	16	1,400	2,500	6.40	1					4	
Wabasha	50	2,487	2,800	14.29	9		1			2	
Waseca	25	2,482	3,500	7.14	2						
Whitebear Lake	15	1,356	1,500	10.00	1			5		1	
Willmar	23	1,825	3,000	7.67	3		1			4	
Winona	211	18,208	25,000	8.44	31		1			3	1
Worthington	11	1,164	2,500	4.45							
Total	5,885		647,970	9.07	705		204	135	24	137	31
Mississippi:											
Bay St. Louis	60	1,974	3,000	20.00							
Greenwood	40	1,055	2,800	15.38	1						
Grenada	51	2,416	3,000	17.00	4		2				
Hattiesburg	35	1,172	4,000	8.75	1		4			4	
Iuka	13	1,019	1,000	13.00			4			1	
Lexington	7	1,075	1,300	5.38	3						
Scranton	18	1,353	2,200	8.18	3		3			2	
West Point	39	2,762	4,000	9.75							
Total	293		21,100	12.46	12		13			7	
Missouri:											
Canton	30	2,241	3,000	10.00	10		1				
Centralia	34	1,275	2,000	17.00	5		3				
Charleston	27	1,381	3,000	9.00	3		3			1	3
Eldorado Springs	85	1,543	3,500	24.29	10		10			1	
Excelsior Springs	18	2,034	3,000	6.00	3						
Fulton	175	4,314	5,000	35.00	10		3		6		
Glasgow	122	1,781	2,000	11.00	9					2	
Hannibal	136	12,857	14,000	9.71	3		5			4	1
Higginsville	50	2,342	3,000	16.67	3		1			3	
Kansas City	2,181	132,716	200,000	10.90	74		41	9	6	35	
Lamar	28	2,860	3,000	9.34	8		5			2	
Lee Summit	15	1,369	1,800	8.33	3		1			1	1
Mexico	80	4,789	6,000	13.33	3		1			1	
Mourne	25	1,830	2,300	10.87	2		1			2	
Mound City	17	1,193	1,900	8.95							
Neosho	31	2,198	3,000	10.33	2		2				
Poplar bluff	51	2,187	4,000	12.75	5		1			4	
Richmond	25	2,895	3,500	7.14	6				1		
St. Louis	8,908	451,770	623,000	14.28	1,001		95	21	28	203	29
Salem	10	1,315	1,500	6.67	1		2				
Salisbury	25	1,672	2,500	10.00	4		6			1	
Stanberry	69	2,035	6,000	11.50							
Total	11,651		896,000	13.00	1,162		181	30	41	260	34
Montana:											
Anaconda	175	3,975	13,000	13.64	5		3	3		2	2
Dillon	5	1,012	2,000	2.50	1						

* Typhus, 3.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Montana—Cont'd.											
Marysville.....	12	1,489	1,500	8.00	1	—	1	—	—	1	—
Phillipsburg.....	14	1,058	1,500	9.33	1	—	3	—	—	1	—
Total.....	206	—	18,000	11.44	8	—	7	3	—	4	2
Nebraska:											
Blair.....	25	2,069	3,000	8.33	4	—	—	—	—	—	—
David.....	7	2,028	2,500	2.80	3	—	1	—	—	1	—
Humboldt.....	5	1,114	1,600	3.13	3	—	—	—	—	—	—
Lexington.....	14	1,392	2,000	7.00	—	—	—	2	—	—	—
Lincoln.....	258	55,154	50,000	19.37	4	—	9	—	—	6	1
Neligh.....	7	1,209	1,500	4.67	1	—	—	—	—	—	2
Omaha.....	943	140,452	160,000	7.14	102	—	32	—	1	16	—
O'Neill.....	10	1,206	1,500	6.67	1	—	—	—	2	—	—
Schuyler.....	25	2,160	2,500	10.00	—	—	3	—	—	10	—
South Omaha.....	206	8,062	16,000	12.88	—	—	—	—	—	—	—
Tekamah.....	12	1,244	1,600	7.50	—	—	—	—	—	—	—
Total.....	1,512	—	242,200	6.24	118	—	45	2	3	33	3
Nevada:											
Eureka.....	20	1,609	1,000	20.00	—	—	—	—	—	—	—
New Hampshire:											
Alton.....	22	1,372	1,400	15.43	1	—	—	—	—	—	1
Amherst.....	25	1,053	1,000	25.00	1	—	—	—	—	—	—
Andover.....	20	1,090	1,000	20.00	1	—	—	—	—	—	—
Barnstead.....	17	1,264	1,260	13.49	—	—	—	—	—	—	—
Barrington.....	19	1,408	1,200	15.83	4	—	—	—	—	1	—
Bartlett.....	17	—	1,500	—	—	—	—	—	—	—	—
Bedford.....	15	1,102	1,100	13.69	4	—	1	—	—	—	—
Belmont.....	25	1,142	1,100	22.79	—	—	—	—	—	—	—
Berlin.....	161	3,729	8,000	20.13	—	—	8	—	7	—	—
Bethlehem.....	21	1,267	1,300	16.15	5	—	—	—	—	—	—
Bristol.....	33	1,524	1,700	19.41	—	—	1	—	—	3	—
Canaan.....	17	1,417	1,500	11.33	1	—	1	—	—	—	—
Claremont.....	104	5,565	6,000	17.33	10	—	1	—	—	1	—
Colebrook.....	19	1,736	2,000	9.50	—	—	1	—	—	—	—
Concord.....	285	17,004	18,000	15.83	17	—	4	—	—	—	1
Derry.....	35	2,604	3,000	11.67	4	—	1	—	—	2	—
Dover.....	278	12,709	13,000	21.38	5	—	3	—	2	2	—
Farmington.....	42	3,064	3,000	14.00	3	—	1	—	2	2	—
Fitzwilliam.....	16	1,122	1,200	13.33	—	—	—	1	—	—	—
Franklin.....	63	4,085	5,000	12.60	—	—	1	—	—	2	—
Greenville.....	28	1,255	1,500	18.67	1	—	—	—	—	—	1
Hanover.....	33	1,817	1,817	18.16	3	—	1	—	—	—	—
Henniker.....	36	1,385	1,400	25.71	—	—	—	—	—	—	—
Hillsboro.....	43	2,120	2,500	17.12	2	—	—	—	—	—	—
Hinsdale.....	42	2,258	2,250	18.67	—	—	—	—	—	—	—
Hollis.....	12	1,000	1,200	12.00	—	—	—	—	—	—	—
Hopkinton.....	25	1,817	1,800	13.89	4	—	—	—	—	—	—
Keene.....	183	7,446	8,000	22.88	17	—	1	—	—	3	—
Kingston.....	14	1,120	1,200	11.67	3	—	—	—	—	—	—
Lebanon.....	54	3,763	4,500	12.00	4	—	—	—	—	1	—
Lisbon.....	31	2,060	2,300	13.48	—	—	1	—	—	—	—
Londonderry.....	18	1,220	1,200	15.00	4	—	—	—	—	—	—
Manchester.....	1,001	44,126	60,000	16.68	73	—	14	3	9	21	2
Marlboro.....	18	1,695	1,695	10.62	2	—	—	—	—	—	—
Milan.....	10	1,029	1,100	11.00	—	—	—	—	—	—	—
Newmarket.....	60	2,742	3,000	20.00	4	—	—	—	—	1	—
Newport.....	50	2,623	3,000	16.67	5	—	2	—	—	2	—
Newton.....	14	1,064	1,100	12.73	—	—	—	—	—	—	—
Northumberland.....	25	1,356	2,000	12.50	—	—	—	—	—	—	—
Ossipee.....	40	1,630	1,800	22.22	4	—	—	2	—	—	—
Peterboro.....	46	2,507	2,500	18.40	—	—	—	—	—	—	—
Pittsfield.....	21	2,605	2,300	9.13	2	—	—	—	—	—	—
Plaistow.....	11	1,085	1,000	10.00	—	—	—	—	—	—	—
Raymond.....	16	1,131	1,130	14.16	2	—	—	—	—	—	—
Salem.....	29	1,805	1,800	16.11	—	—	—	—	—	—	—

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population. United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
New Hampshire—											
Continued.											
Sanbornton.....	21	1,027	1,000	21.00	—	—	—	—	—	—	—
Somersworth.....	157	6,207	6,500	24.15	—	—	1	—	1	1	—
Swanzy.....	27	1,600	1,600	16.88	—	—	—	—	—	—	—
Warner.....	39	1,383	1,385	28.16	—	—	1	—	—	3	—
Wilton.....	33	1,850	1,560	21.15	—	—	—	—	—	—	—
Winchester.....	139	2,584	2,500	15.60	—	—	—	—	—	—	—
Wolfboro.....	45	3,020	3,030	14.85	1	—	—	—	—	1	—
Total.....	3,455	—	202,927	17.03	197	—	44	6	21	34	5
New Jersey:											
Boundbrook.....	34	1,462	2,500	13.60	1	—	—	—	—	4	—
Bridgeton.....	190	11,424	14,000	13.57	23	—	9	2	—	4	—
Carlstadt.....	41	1,549	3,000	13.67	1	—	—	—	—	1	—
Clayton.....	39	1,807	2,000	19.50	—	—	3	—	—	—	—
Dunellen.....	17	1,660	1,400	12.14	5	—	—	—	—	3	—
Egg Harbor.....	27	1,439	1,537	17.57	2	—	—	1	—	—	—
Florence.....	25	1,340	1,500	16.67	—	—	—	—	—	1	—
Frenchtown.....	14	1,253	1,050	13.33	1	—	1	—	—	—	—
Hackensack.....	81	6,004	7,500	10.80	—	—	—	—	1	9	—
Hackettstown.....	37	2,417	2,500	14.80	1	—	—	—	—	1	—
Haddonfield.....	40	2,562	2,600	15.38	4	—	—	—	—	5	—
Hoboken.....	1,247	43,648	61,868	20.16	114	—	8	9	16	54	3
Jersey City.....	3,919	163,003	195,847	20.01	430	—	71	9	58	124	47
Lambertville.....	76	4,142	4,620	16.45	2	—	1	2	—	1	—
Morristown.....	197	8,150	10,000	19.70	—	—	—	—	—	—	—
Newark.....	4,363	181,830	235,000	18.30	611	—	41	12	15	133	32
New Brunswick.....	367	18,603	20,863	17.59	13	—	7	—	1	8	—
Ocean Grove.....	41	2,754	2,000	20.50	3	—	—	—	—	—	—
Palmyra.....	44	1,966	2,500	17.60	9	—	—	—	—	—	—
Passaic.....	560	3,028	22,000	25.45	4	—	9	1	2	2	—
Plainfield.....	218	11,267	15,000	14.53	23	—	1	—	—	5	—
Riverside.....	18	1,340	2,300	6.96	—	—	—	—	—	—	—
Riverton.....	16	1,075	1,300	12.31	6	—	—	—	—	—	—
South Amboy.....	82	4,330	7,000	11.71	—	—	4	—	—	4	—
South Orange.....	42	3,106	5,000	8.04	7	—	2	—	—	—	—
South River.....	224	1,796	3,375	6.71	—	—	—	—	1	2	—
Woodbury.....	52	3,911	4,000	13.00	5	—	—	1	—	—	—
Total.....	11,754	—	532,460	13.58	1,240	—	145	35	94	352	84
New Mexico:											
East Las Vegas.....	44	3,212	3,500	13.24	24	5	1	2	2	—	—
Socorro.....	110	2,295	2,000	5.00	2	3	—	1	—	—	1
Total.....	54	—	5,500	9.82	26	8	1	3	2	—	1
New York:											
Adams.....	17	1,360	1,300	13.08	4	—	—	—	—	—	—
Addison.....	43	2,160	3,000	14.33	5	—	3	—	—	—	—
Akron.....	17	1,492	1,500	11.33	—	—	—	—	—	—	—
Albion.....	65	4,586	4,971	13.08	10	—	2	—	—	—	1
Alexandria Bay.....	12	1,123	1,300	9.23	—	—	—	—	—	—	—
Amityville.....	27	2,293	2,300	11.74	1	—	—	—	—	—	—
Athens.....	39	2,024	2,000	19.50	5	—	—	—	—	—	—
Auburn.....	386	25,858	30,000	12.87	33	—	2	—	—	—	—
Ballston Spa.....	52	3,040	4,200	12.38	—	—	1	—	—	—	—
Batavia.....	109	7,221	8,500	12.82	11	—	3	—	—	—	1
Binghamton.....	667	35,005	45,000	14.82	61	—	28	2	1	13	1
Boonville.....	42	1,613	3,512	11.96	5	—	1	—	—	—	—
Brookport.....	72	3,742	4,500	16.00	10	—	2	—	—	—	—
Buffalo.....	4,533	255,664	370,000	12.24	415	—	98	—	14	80	35
Cambridge.....	29	1,598	1,500	19.33	5	—	—	—	—	—	—
Canajoharie.....	52	2,089	5,500	9.45	6	—	1	—	—	1	—
Canandaigua.....	70	5,868	6,000	11.67	4	—	—	—	1	1	—
Canastota.....	60	2,774	3,188	18.82	5	—	1	—	—	—	3
Canton.....	100	2,580	6,015	16.63	49	—	1	1	1	—	—

¹ Typhus.² Typhus, 1.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
New York—Cont'd.											
Cape Vincent.....	25	1,324	3,000	8.33							
Castile.....	33	1,146	2,451	13.46	1						
Castleton.....	19	1,127	1,260	15.08	2						
Catskill.....	95	4,920	5,253	18.08	6			5		2	
Champlain.....	12	1,275	1,300	9.23	4						
Chateaugay.....	40	1,172	1,100	36.36	4		1				
City Island.....	10	1,206	1,206	8.29	2		1				
Clinton.....	18	1,269	1,100	16.36							
Clyde.....	67	2,638	5,000	13.40	6		1			1	
Cobleskill.....	54	1,822	3,436	15.71	9		1			1	1
Corinth.....	35	1,222	2,500	14.00	4		1				
Corning.....	144	8,550	12,000	12.00	11		5	3	1	7	
Coxsackie.....	72	1,611	3,824	18.83	2		1		1		
Cuba.....	21	1,368	2,900	7.24							
Delhi.....	38	3,758	3,000	12.67	7						
Dobbs Ferry.....	51	2,083	3,000	17.00	5		1			3	
Dundee.....	19	1,200	1,400	13.57							
Dunkirk.....	161	9,416	13,200	12.20	8		1	1		6	2
East Aurora.....	44	1,582	2,000	22.00							
East Syracuse.....	24	2,231	2,400	10.00	2						
Elmira.....	491	38,893	35,000	14.03	54		16	1	1	2	5
Fairport.....	51	2,552	3,000	17.00	5						
Fishkill on the											
Hudson.....	74	3,617	4,500	16.48	9		1				
Franklinville.....	29	1,021	2,500	11.60	2						
Fredonia.....	45	3,399	4,000	11.25	3				1		
Friendship.....	25	1,369	1,500	16.67			1				
Fulton.....	95	4,214	4,700	20.21	14		3				
Fultonville.....	15	1,122	3,000	5.00							
Geneseo.....	40	2,286	2,500	16.00	6					1	
Geneva.....	153	7,557	11,000	13.91					2	1	
Glens Falls.....	228	9,509	13,000	17.54	22		3				3
Green Island.....	99	4,463	4,500	22.00	12		4			3	
Greenwich.....	41	1,663	2,200	18.64	6						
Groton.....	48	1,280	2,500	19.20	1						
Hamburg.....	61	1,331	4,000	15.25	3					1	
Hamilton.....	19		2,000	9.50	2		1				
Hancock.....	32	1,279	4,000	8.00				2	1	3	
Hastings upon											
Hudson.....	27	1,466	1,800	15.00	5						
Holley.....	15	1,381	1,400	10.71	2					1	
Hudson.....	169	9,970	10,000	16.90	19		4			1	
Huntington.....	116	3,028	9,000	12.98	15						
Irrington.....	19	2,299	2,077	9.15							
Islip.....	62	3,000	3,000	20.67							
Johnstown.....	121	7,768	10,000	12.10	15		6			1	
Jordan.....	38	1,271	1,500	25.33	7						
Lancaster.....	51	1,692	3,564	14.31	3		4				
Lansingburg.....	227	10,550	13,000	17.46	18		8				
Little Falls.....	128	8,783	10,000	12.80	12		1			1	1
Liverpool.....	153	1,284	1,200	44.17	3					1	
Lockport.....	258	16,038	20,000	12.90	19		29		2	6	2
Malone.....	78	4,986	5,000	15.60	6						
Mayville.....	41	1,164	3,200	12.50							
Mechanicsville.....	86	2,679	5,000	17.20	3		3			8	
Mexico.....	17	1,315	1,325	12.83	4						
Middlebury.....	41	1,139	3,000	13.67	6		1				
Middleport.....	22	1,217	1,400	15.71							
Middletown.....	328	11,977	14,000	23.43	28		7		1	6	
Montgomery.....	25	1,024	1,000	35.00	5						
Monticello.....	9	1,016	1,100	8.18	5						
Mount Morris.....	28	2,286	2,400	11.67							
Mount Vernon.....	238	10,830	23,000	10.35	57		4	4	1	4	
New Hartford.....	50	6,000	6,000	8.33	1						
New York City.....	266,314	2,321,604	3,438,829	19.28	7,725	1	677	650	703	1,776	714
Niagara Falls.....	263	5,502	21,000	12.52	3		14			5	
North Hempstead.....	182	10,000	10,000	18.20	15		1			5	6

¹ Typhus, 1.² Typhus, 901.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
New York—Cont'd.											
North Tarrytown	53	3,179	4,000	13.25	1				1		
North Tonawanda	101	4,793	10,000	10.10			2			4	
Norwich	101	5,212	6,004	16.82	9		3			5	
Norwood	30	1,463	1,750	17.14	4		1				
Nyack	50	4,111	5,603	8.92	8		2				1
Olean	80	7,358	12,000	6.67						1	
Oneida	92	6,058	6,134	14.98	13		2		1	1	
Oneonta	125	6,272	10,000	12.50	5		3			1	
Oswego	315	21,842	25,000	12.60	29		4	1		5	
Oxford	59	1,477	5,200	11.35							
Palmyra	54	2,131	5,000	10.80	8						
Peekskill	179	9,676	10,000	17.90	31		3	1	2	6	4
Penn Yan	75	4,254	4,300	18.75	8		2				
Phelps	68	1,336	5,150	13.20	1		2				
Plattsburg	134	7,010	8,440	14.69	12		5			6	
Port Byron	42	1,105	1,800	23.33	1						
Port Ewen	26	1,211	1,200	21.67						1	
Port Jefferson	28	2,026	2,000	14.00							
Potsdam	71	3,961	5,000	14.20	14		3	1			1
Pulaski	20	1,517	1,500	13.33			2				
Randolph	17	1,201	1,200	14.17	2						
Rensselaer	144	7,462	7,462	19.30	14		11			10	8
Rhinebeck	63	1,649	3,500	18.00	1		3			2	
Richfield Springs	23	1,623	1,600	14.38							
Rochester	2,191	133,896	175,000	12.52	267		20	1	8	42	24
Rosendale	87	1,706	6,125	14.20	4		2			2	
St. Johnsville	32	1,236	2,000	16.00			2				
St. Regis Falls	19	1,210	2,000	9.50	2		1				1
Sandy Hill	57	3,692	4,100	13.90	3		1			2	1
Saratoga	249	11,975	12,000	20.75	23		1		1	2	
Saugerties	185	4,237	11,000	16.82	27		2	1			
Schenectady	301	19,902	24,374	12.35			2			5	1
Schuylerville	35	1,387	1,000	35.00	12		1			2	1
Seneca Falls	80	6,116	8,000	10.00	17		1		2	1	
Sidney	64	1,358	5,000	12.80	17		2	3			
Silver Creek	20	1,678	1,800	11.11	3					1	
Sodus	88	1,028	5,000	19.60	5						
Springville	17	1,883	2,200	7.73	3						
Theresa	14	1,028	1,000	14.00	1						
Ticonderoga	67		6,000		2		1		1		
Trumansburg	20	1,211	1,440	13.89	3						
Unadilla	45	1,157	2,606	17.31	1						1
Valatie	21	1,437	1,200	17.50							
Walden	57	2,132	3,500	16.29	2		1				
Walton	72	2,290	7,000	10.28	3						
Wappingers Falls	63	3,718	3,000	21.00	6					1	
Warsaw	80		4,700		5					1	
Waterloo	66	4,350	4,700	14.04	8						
Watertown	292	14,725	22,000	13.27	4		15			3	
Waterville	24	2,024	1,700	14.12	1						
Weedsport	34	1,580	2,000	17.00	3						
Wellsville	45	3,435	3,700	12.61	3		1			2	
White Plains	110	4,042	6,000	18.33	11		2			3	
Yonkers	752	32,033	42,000	17.90	85		4	3	2	31	27
Total	88,963		4,820,063	18.46	9,492		1,063	682	749	2,088	830
North Carolina:											
Charlotte	1,303	11,557	27,000	11.22	27	1	9				2
Durham	60	5,485	6,000	10.00	11		1	1			1
Goldsboro	109	4,017	8,000	13.63	14		2				1
Lexington	17	1,140	2,500	6.80							
Raleigh	216	12,678	16,000	13.50	39		2	2		3	
Salem	39	25,711	4,500								
Washington	131	3,545	6,000	21.85	13		3	1			1
Total	875		70,000	12.50	101	1	17	4		3	5

¹ White, 135; colored, 168.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Ohio:											
Ada	14	2,079	3,000	4.67	6			9			
Antwerp	16	1,331	1,600	10.00						1	
Ashland	41	3,566	4,500	9.11	5		3				
Athens	46	2,620	3,500	13.14	4		3	4			
Barnesville	49	3,207	4,000	12.25							
Bedford	15	1,043	1,500	10.00							
Bellaire	157	9,934	10,000	15.70	22		6		1	4	2
Bellefontaine	45	4,245	8,000	5.63	7		1				
Bellevue	42	3,052	4,500	9.33						4	
Blanchester	25	1,196	1,600	15.63	3		1				
Bowling Green	17	3,467	6,000	2.83	5		5		4	2	
Bradford	8	1,338	1,600	5.00	3						
Bridgeport	40	3,369	4,000	10.00	3		5				1
Brooklyn	26	4,585	4,585	5.67	1		3				
Bryan	39	3,068	4,000	9.75	10					5	
Bucyrus	68	5,975	8,000	8.50	10		2			1	
Cadiz	30	1,716	2,500	12.00	12		1				
Caldwell	4	1,248	1,300	3.08	2						
Cambridge	83	4,361	9,000	9.22	15		8			2	
Carey	19	1,605	2,000	9.50	5						
Carrollton	20	1,228	1,500	13.33	2						
Carthage	24	2,257	2,500	9.60	4						
Celina	24	2,702	3,000	8.00	3		3	8	3	7	1
Circleville	109	6,556	7,000	15.57	4		5	12			
Cleveland	5,040	261,353	370,000	13.62	192		121	12	29	146	16
Columbiana	32	1,112	1,800	17.78	2		1		1		
Columbus	1,390	88,150	140,000	9.92	219		33	16	1	15	10
Conneaut	66	3,241	5,000	13.20	5		3			3	
Corning	11	1,551	1,800	6.11	1		3	3			
Coshocton	52	3,672	5,000	10.40	4		4	1	1	1	
Covington	24	1,778	2,000	12.00	2		1		21		
Crestline	26	2,911	3,500	7.43							
Defiance	74	7,694	10,000	7.40			1		1		
Degraff	5	1,076	1,300	3.85	4						
Delaware	104	8,224	10,000	10.40	20		5			2	
Delta	14	1,132	1,600	8.75					1		
Doylestown	5	1,131	1,200	4.17							
Dunkirk	20	1,220	1,220	16.39	1				4		
East Liverpool	170	10,956	16,000	10.63	15		13				3
East Palestine	13	1,816	2,500	5.20	3						2
Elmore	8	1,198	1,200	6.67	2						
Findlay	172	18,553	20,000	8.60	30		2		6	3	
Fort Recovery	10	1,186	1,600	6.25						4	
Fostoria	94	7,070	10,000	9.40	1		3			2	
Franklin	38	2,729	3,000	12.67	7		3				
Fremont	90	7,141	8,000	11.25	18		6			2	
Gallipolis	146	4,498	6,000	24.33	16		3			3	
Geneva	40	2,194	2,400	16.67	4						
Germantown	13	1,437	2,000	6.50			1				
Glendale	23	1,444	1,440	15.97	5					1	
Greenville	50	5,473	5,600	8.93	11		1	1		1	
Hartwell	31	1,507	2,000	15.50	3						
Hillsboro	49	3,620	4,500	10.89							
Hubbard	17	1,498	1,500	11.33	1						
Ironton	184	10,939	14,000	13.14	27		11			1	2
Jackson	86	4,320	5,500	15.64			2			6	
Jefferson	33	1,346	1,500	22.00	3		3		1		
Kent	45	3,501	4,000	11.25			6			2	
Kenton	63	5,557	9,000	7.00	15		1			3	
Lancaster	119	7,555	9,000	13.22	22		3				
Lebanon	34	3,050	3,500	9.71	6						
Leetonia	38	3,826	4,000	9.50	3		3			3	
Lima	320	15,981	30,000	10.67	37		4				
Lockland	¹ 38	2,474	3,500	10.86	1		1		1		
Logan	44	3,119	3,500	12.57	7		3	1		1	
Londonville	17	1,444	1,500	11.33	1						
Louisville	² 25	1,323	3,000	8.33	3		1				
McConnellsville	20	1,771	2,000	10.00	6		2				

¹ Typhus, 2. ² Varioloid, 1.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States censuses of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Ohio—Continued.											
Marion.....	126	8,327	12,000	10.50			7			1	1
Martins Ferry.....	115	6,250	8,000	14.38	17		3				6
Marysville.....	26	2,810	4,000	6.50	5		1				
Massillon.....	108	10,062	13,000	8.31	9		4	1		7	
Maumee.....	19	1,645	1,800	10.56						5	
Mechanicsburg.....	27	1,459	2,500	10.80	7		1	2		1	
Miamisburg.....	56	2,952	4,000	14.00	9					1	1
Middleport.....	52	3,211	3,000	17.33	10		1	3		3	
Middletown.....	109	7,681	10,000	10.90	12		1	6			
Millersburg.....	28	1,923	2,100	13.33	5					5	
Montpelier.....	12	1,293	2,200	5.45	3						
Napoleon.....	26	2,764	4,000	6.50	4		2				
Nelsonville.....	66	4,558	6,000	11.00	4		2			4	
Newark.....	202	14,270	20,000	10.10	21		4			7	1
New Bremen.....	12	1,239	1,800	6.67	3						
New Lexington.....	30	1,470	2,000	15.00			1				
New London.....	16	1,096	1,500	10.67							
New Philadelphia.....	80	4,456	6,000	13.33	11		2			2	
New Richmond.....	14	2,782	2,500	4.00	2		3	4			
New Straitsville.....	18	2,782	2,000	6.21							
North Amherst.....	18	1,648	1,800	10.00	3		1				
North Baltimore.....	33	2,857	3,200	10.31	3		1				
Norwalk.....	60	7,195	8,000	7.50	10						
Oberlin.....	61	4,376	4,700	12.98	12		3				
Orrville.....	33	1,765	2,000	16.50	3		2				
Ottawa.....	32	1,717	2,500	12.80	5		1	1			1
Painesville.....	79	4,755	8,900	8.88	8		2			2	
Paulding.....	15	1,879	3,100	4.84	12		2	4		1	1
Pleasant Ridge.....	8	1,027	1,250	6.40							
Pomeroy.....	35	4,726	5,000	7.00							
Port Clinton.....	32	2,049	3,000	10.67	4						
Portsmouth.....	222	12,395	18,000	12.33	22		9		1	7	2
Ravenna.....	27	3,417	4,000	6.75	5						
Richwood.....	21	1,415	1,800	11.67	7						
Sabina.....	15	1,080	1,700	8.82	1						
St. Bernard.....	23	1,779	2,850	8.07	7					1	
St. Mary.....	60	3,000	6,000	10.00	8		5	4		2	3
Salem.....	81	5,789	8,000	10.13	11					1	
Salineville.....	31	2,369	2,500	12.40	2						
Sidney.....	70	4,850	6,000	11.67	12		2	1			
Somerset.....	15	1,127	1,500	10.00						1	
South Charleston.....	9	1,041	1,200	7.50	1		4			2	
Spencerville.....	28	1,266	2,000	14.00	7		2			4	
Springfield.....	433	31,895	40,000	10.83	51		9	2	4	12	
Tiffin.....	133	10,801	15,000	8.87	17		7				
Tippecanoe.....	12	1,465	1,200	10.00							
Toledo.....	1,564	81,494	151,520	10.32	138		31	1	5	31	9
Troy.....	76	4,494	5,000	15.20	14		9			2	
Urbana.....	113	6,510	7,500	15.07	11		2			1	
Urichsville.....	36	3,842	5,000	7.20	6		3				
Versailles.....	17	1,385	1,600	10.63	1						
Wapakoneta.....	36	3,616	4,500	8.00	5						
Warren.....	90	5,973	11,000	8.18							1
Waverly.....	45	1,567	2,000	22.50						4	
Wellston.....	111	4,377	8,000	13.88			15	5	2	15	
Wellsville.....	74	5,247	6,500	11.38	6		3			1	
Westerville.....	18	1,229	1,700	10.59							
Willoughby.....	27	1,219	2,000	13.50	2			1	1		
Woodfield.....	15	1,031	1,700	8.82							
Wyoming.....	13	1,454	1,800	7.33	1			1			
Xenia.....	104	7,301	8,000	13.00	20		3			2	
Youngstown.....	527	33,220	50,167	10.50	40		25			5	13
Total.....	15,458		1,367,832	11.30	1,338		462	93	88	357	76
Oregon:											
Portland.....	987	46,385	92,500	9.70	107		20	2		13	3

¹ Typhus, 10.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Popula- tion, United States cen- sus of 1890.	Esti- mated popu- lation.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phtthis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and mem- branous croup.	Whooping cough.
Pennsylvania:											
Allegheny	2,036	105,287	135,000	15.08	172	...	73	20	12	33	36
Altoona	450	30,337	42,500	10.59	44	...	13	1	3	12	12
Ambler	26	1,073	2,000	13.00	1	...	1	...	...	...	...
Archbald	90	4,032	6,000	15.00	1	...	1	...	...	...	...
Ashley	66	3,192	4,000	16.50	...	...	...	...	...	1	...
Austin	20	1,679	3,300	6.06	3	...	3	...	...	4	...
Avoca	51	3,031	3,031	21.68	3	...	1	...	...	...	...
Beaverfalls	128	9,735	10,000	12.80	16	...	15	...	2	1	...
Bellevue	36	1,418	3,600	10.00	...	...	1	...	...	...	...
Berwick	48	2,701	4,000	12.00	...	...	12	...	...	...	...
Blakely	43	2,452	4,000	10.75	1	...	...	...	...	5	...
Blossburg	35	2,568	2,800	12.50	...	...	...	...	...	...	...
Bradford	158	10,514	20,000	7.90	12	...	...	...	...	2	...
Bridgeport, Mont- gomery County.	52	2,651	3,900	13.33	3	...	1	...	...	12	...
Bridgewater	16	1,177	1,200	13.33	...	...	...	...	...	...	...
Bristol	116	6,553	7,000	16.57	13	...	2	...	1	1	...
Brookville	24	2,478	2,800	8.57	3	...	1	...	...	...	...
Butler	131	8,734	12,000	10.92	5	...	12	1	...	2	...
Canton	8	1,393	2,000	4.00	...	...	...	...	...	...	...
Carlisle	161	7,620	11,135	14.45	16	...	3	1	1	...	...
Catasauqua	60	3,704	3,704	16.20	5	...	1	...	...	3	...
Catawissa	22	1,800	2,500	8.80	...	...	1	...	...	...	...
Chambersburg	158	7,863	8,602	18.38	21	...	...	3	...	3	3
Chester	422	20,226	35,000	12.06	70	...	...	...	6	12	1
Clarendon	5	1,297	1,500	3.33	2	...	...	...	...	...	...
Clarion	16	2,164	2,500	6.40	...	...	2	...	...	...	...
Connellsville	93	5,629	6,800	13.68	5	...	...	1	1	2	...
Conshohocken	83	5,470	6,500	12.77	7	...	2	...	...	1	...
Cressona	30	1,481	1,700	17.56	...	...	...	...	...	1	...
Darby	26	2,972	3,000	8.67	2	...	1	...	...	3	1
Dowington	46	1,920	2,094	21.97	4	...	...	...	1	...	...
Duncannon	12	1,074	1,200	10.00	...	...	...	...	...	...	...
Dunmore	161	8,315	15,000	10.77	2	...	3	...	...	5	...
East Brady	11	1,228	1,300	8.46	1	...	1	...	...	...	...
Elizabeth	18	1,804	2,000	9.00	1	...	2	...	...	...	...
Elizabethtown	17	1,218	1,400	12.14	...	...	...	...	...	...	...
Emporium	13	2,147	2,500	5.20	1	...	...	1	...	1	2
Erie	611	40,634	58,000	10.53	57	...	7	...	3	14	2
Etna	66	3,767	3,800	17.37	6	...	6	2	2	1	6
Everett	22	1,679	1,679	13.10	6	...	...	...	...	...	...
Frackville	40	2,520	3,000	13.33	...	...	1	...	...	...	...
Franklin	64	6,221	8,000	8.00	1	...	1	...	...	...	...
Freeport	26	1,637	2,000	13.00	2	...	1	...	...	...	...
Gettysburg	65	3,221	3,800	17.11	...	...	...	...	...	...	...
Gilberton	68	3,687	3,900	17.18	2	...	...	...	...	...	2
Greensburg	55	4,202	6,100	9.02	1	...	1	...	...	5	1
Hanover	36	3,746	5,000	7.20	1	...	1	...	...	...	...
Harrisburg	655	39,385	50,000	13.10	65	...	15	1	8	9	...
Hazleton	160	11,872	20,000	8.00	6	...	1	...	1	8	3
Hollidaysburg	92	2,975	2,918	31.52	...	...	...	...	...	...	...
Homestead	27	7,911	10,000	2.70	1	...	1	...	...	5	...
Houtzdale	9	2,231	2,000	4.50	2	...	1	...	...	1	...
Jeannette	83	3,296	7,000	11.86	1	...	...	...	...	1	...
Jenkintown	32	1,609	3,000	10.67	...	...	...	...	...	...	...
Jermyn	37	2,650	3,000	12.33	5	...	...	...	...	1	2
Johnsonburg	23	1,280	4,000	5.75	1	...	...	...	...	7	...
Kennett Square	22	1,326	1,500	14.67	3	...	1	1	...	1	...
Kingston	55	2,381	2,600	21.15	1	...	...	...	...	1	1
Kittanning	59	3,095	3,500	16.86	3	...	8	6	...	1	...
Knoxville	10	1,723	11,000	10.00	...	...	...	...	...	...	...
Lancaster	582	32,011	43,162	13.44	46	...	26	2	...	4	4
Lansford	65	4,004	5,000	13.00	...	...	...	2	...	1	...
Latrobe	56	3,589	4,850	11.55	8	...	1	...	...	...	1
Lehighton	36	2,959	5,000	7.20	3	...	...	...	...	...	...
Lewisburg	55	3,248	3,200	17.19	5	...	1	...	...	2	...
Lewistown	31	3,273	3,500	8.86	3	...	4	...	...	...	...
Lititz	16	1,494	1,800	8.88	1	...	1	...	...	1	...
Lockhaven	69	7,358	9,000	7.67	11	...	3	...	...	...	...

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Pennsylvania—Continued.											
Lykens.....	70	2,450	2,750	25.45							
McKeesport.....	471	20,741	35,000	13.45	11		15			18	1
McSherrystown..	18	1,020	1,500	12.00	2					2	
Mahanoy City....	214	11,286	15,000	14.27	8					5	1
Manheim.....	38	2,070	2,200	17.27	1					2	
Meadville.....	87	9,520	12,000	7.25	9		2	1		1	
Mechanicsburg..	68	3,691	4,500	15.16	1					2	
Media.....	38	2,736	3,335	11.31	1						
Meyersdale.....	30	1,847	3,000	10.00	4				1	10	
Millersburg.....	15	1,527	1,650	9.09	1						
Millerstown.....	1	1,162	1,100	1.00							
Minersville.....	66	3,504	6,000	11.00	1					2	1
Mount Carmel...	274	8,254	15,000	18.27	1				1	8	
Mount Holly Springs	21	1,190	1,250	16.80	1		3				
Nazareth.....	23	1,318	2,000	11.50	1						
Nesquehoning...	18	1,655	2,000	9.00							
New Brighton...	79	5,616	7,000	11.29	7		5				
Newcastle.....	351	11,000	35,000	10.29	5		25	4	2	14	1
Newhaven.....	16	1,221	1,800	8.89	4						
Newhope.....	28	1,142	1,200	23.33							
Newtown.....	20	1,213	1,400	14.44	6						
Newville.....	22	1,562	1,500	14.67					1	1	
Norristown.....	299	19,791	22,500	13.29	26		5	2	1	6	
Northeast.....	27	1,538	2,500	10.80							
Northumberland..	26	2,744	3,000	8.67	4					1	
North Wales....	20	1,060	1,400	14.29	2					1	
Oakmont.....	27	1,678	2,500	10.80				1			
Oil City.....	127	10,932	18,000	7.06	7		4			3	
Olyphant.....	34	4,083	4,000	8.50							
Orwigsburg.....	17	1,290	1,400	12.14						1	
Parkersburg.....	24	1,514	2,100	11.43							
Parsons.....	15	2,412	5,000	3.00	3		1				
Phoenixville....	157	8,514	8,500	18.47	3		3		1	4	
Pine Grove.....	10	1,103	1,200	8.33	1						
Pittsburg.....	5,114	238,617	298,772	17.12	337		179	67	24	89	167
Pittston.....	177	10,302	15,000	11.80				1		2	
Plymouth.....	215	9,344	14,000	15.34			5	1	1	14	
Port Allegheny...	5	1,230	2,000	2.50							
Pottstown.....	210	13,285	16,000	13.13	23		7			14	1
Quakertown.....	46	2,169	3,000	15.33	9		3			1	
Reading.....	1,064	58,661	76,000	14.00	89		45	1	4	22	12
Renovo.....	51	4,154	4,500	11.33	1						
Reynoldsville...	22	2,789	4,000	5.50			1				
Ridgway.....	31	1,903	5,000	6.20							
Royersford.....	6	1,815	2,500	2.40						1	
Saint Clair.....	1133	3,680	7,000	18.57	5		1			2	
Scottdale.....	39	2,693	4,000	9.75	2		4			2	
Scranton.....	1,596	75,215	105,000	15.29	45		13		4	77	13
Selinsgrove.....	24	1,315	1,600	15.00						1	
Sewickley.....	31	2,776	3,500	8.86							2
Sharpsburg.....	90	4,898	6,000	15.00			4				
Sharpsville.....	39	2,330	3,000	10.00	2			1	1		
Shenandoah.....	354	15,944	20,000	17.70	13				6	12	1
Shippensburg...	6	2,188	4,000	1.50	5					1	
Slatington.....	58	2,716	4,000	14.50	4						
South Bethlehem..	219	10,302	13,000	16.58	4		5			6	
South Forks....	19	1,295	3,000	6.33	4		7	1	1	4	
Steelton.....	151	9,250	10,000	15.10	4		4		1	14	1
Summit Hill.....	38	2,816	2,500	15.20	2		2				
Sunbury.....	116	5,930	10,000	11.60	11		4				
Susquehanna.....	74	3,872	4,000	18.50	2					1	
Tarentum.....	50	4,627	5,000	10.00			1	6			
Tidioute.....	12	1,328	1,200	10.00							
Titusville.....	94	8,073	9,000	10.44	18					3	1
Tremont.....	29	2,064	2,000	14.50							
Troy.....	18	1,307	1,400	12.86	3					1	

¹ Typhus, 1.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Popula- tion, United States cen- sus of 1890.	Esti- mated popu- lation.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and mem- branous croup.	Whooping cough.
Pennsylvania—Continued.											
Tyrone	64	4,705	7,000	9.14	—	—	—	—	—	1	—
Upland	21	2,275	2,000	10.50	7	—	—	—	—	—	—
Verona	18	1,477	2,000	9.00	—	—	—	—	—	—	—
Washington	110	7,063	9,000	12.22	16	3	—	—	—	4	—
Waynesboro	37	3,811	3,000	12.33	5	1	—	—	—	1	—
Weatherly	39	2,961	3,500	11.14	4	—	1	1	—	1	1
Wellsboro	46	2,961	3,000	15.33	2	—	—	—	—	2	—
West Bethlehem	52	2,759	4,000	13.50	—	—	6	—	—	6	—
West Fairview	19	1,137	1,000	19.00	1	2	2	—	1	1	1
West Newton	26	2,285	3,000	8.67	—	3	3	—	—	2	—
West Pittston	150	3,906	6,700	22.39	5	2	2	—	—	2	—
Wilkesbarre	648	37,718	55,000	11.78	—	—	17	—	1	17	—
Wilkinsburg	122	4,662	15,000	8.13	7	2	—	—	1	3	—
Williamsport	265	27,132	35,000	7.29	24	4	—	—	—	7	—
Wrightsville	32	1,912	24,000	13.33	—	—	—	—	—	—	—
York	472	20,793	30,000	15.73	33	—	46	2	2	11	14
Total	23,107	—	1,720,282	13.43	1,446	2	727	123	84	572	302
Rhode Island:											
Bristol	109	5,478	6,700	16.27	13	—	1	—	—	—	—
Central Falls	236	—	17,000	13.88	26	—	—	2	1	3	—
Little Compton	18	1,128	1,145	15.72	—	—	—	—	—	—	—
Middletown	15	1,154	1,413	11.62	—	—	—	—	—	—	—
Newport	338	19,457	21,500	15.72	40	—	5	—	1	3	—
North Kingstown	63	4,193	5,080	12.38	—	—	—	—	—	1	—
Warren	84	4,489	4,500	18.67	10	—	—	—	—	—	1
Woonsocket	460	20,830	28,000	16.43	56	3	—	—	—	10	—
Total	1,323	—	85,348	15.50	145	—	9	2	2	17	3
South Carolina:											
Anderson	102	3,018	6,000	17.00	18	—	1	—	—	—	—
Florence	88	3,395	5,500	16.00	9	—	1	—	—	—	1
Graniteville	30	1,791	2,500	12.00	—	—	—	—	—	1	—
Greenville	120	8,607	14,000	8.57	13	1	2	—	—	3	1
Greenwood	140	1,325	4,000	10.00	1	—	10	—	—	7	1
Manning	10	1,069	1,500	6.67	3	—	1	—	—	—	—
Marion	12	1,640	2,000	6.00	—	—	—	—	—	—	—
Pelzer	55	1,878	6,000	9.17	—	—	—	—	—	—	—
Walterboro	13	1,171	1,700	7.65	2	—	3	—	—	—	—
Total	470	—	43,200	10.88	36	1	18	—	—	11	3
South Dakota:											
Deadwood	54	2,366	6,000	9.00	4	—	4	—	—	2	—
Mitchell	32	2,217	3,000	10.67	1	—	—	3	—	—	—
Sioux Falls	67	10,177	12,000	5.59	4	—	2	—	—	—	—
Vermilion	20	1,496	2,500	8.00	—	—	—	—	—	—	—
Total	173	—	23,500	7.36	9	—	6	3	—	4	—
Tennessee:											
Brownsville	234	2,516	3,000	78.00	43	—	31	—	—	5	6
Clinton	19	1,198	1,200	15.83	5	—	2	—	—	1	—
Covington	26	1,067	2,500	10.40	4	—	5	—	4	—	—
Fayetteville	230	2,410	3,000	10.00	5	—	11	—	—	—	—
Maryville	25	1,686	3,000	12.50	6	—	5	—	—	2	—
McMinnville	5	1,677	2,000	2.50	3	—	—	—	—	—	—
Murfreesboro	88	3,739	5,000	17.60	16	—	2	1	—	4	—
Nashville	1,607	76,168	87,754	18.24	177	—	19	—	—	29	3
Newbern	20	1,236	1,800	11.11	—	—	1	—	—	1	—
Savannah	10	1,087	1,400	7.14	4	—	2	—	—	4	—
Soddy	20	1,173	2,000	10.00	2	—	5	—	—	1	—
South Pittsburg	100	1,479	5,000	28.00	8	—	15	5	—	25	—
Total	2,284	—	117,654	19.41	273	—	98	8	4	72	11

¹ Typhus, 5.² White, 11; colored, 19.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Texas:											
Ablene	151	3,198	5,000	10.20	7		17	7		6	
Brownwood	48	6,134	4,000	12.00							
Burnet	10	1,454	1,500	6.67	2		3			1	
Caldwell	14	1,250	2,000	7.00	3		4			1	
Dallas	2661	38,067	64,224	10.29	95		20	2	1	6	4
Decatur	12	1,846	2,000	6.00							
Flaton	8	1,304	2,000	4.00			1				
Gainesville	106	6,594	12,000	8.83			11		1	5	
Giddings	10	1,203	1,600	6.25			1				
Henrietta	16	2,100	2,500	6.40	2						
Lampasas	21	2,408	3,000	7.00	1						
Lockhart	21	1,223	2,100	10.00	3		3			4	
Rio Grande	30	1,968	1,600	18.73	10						
Rockport	13	1,069	1,500	8.67	5						
San Antonio	1,150	37,673	63,000	18.25	271	1	20		6	13	8
Temple	57	4,047	10,000	5.70			1			3	1
Terrell	31	2,988	6,500	4.77							
Vernon	15	2,857	3,000	5.00	1					3	
Weatherford	42	3,369	5,500	5.64							
Total	2,316		193,024	12.00	400	1	81	9	8	43	13
Utah:											
Brigham	46	2,139	2,800	16.43	3		4			1	4
Eureka	43	1,733	3,000	14.33			3			1	
Mount Pleasant	50	2,254	2,600	19.23			1		2	7	
Ogden	213	14,889	18,000	11.83	11		3	2	6		5
Park City	30	2,850	4,000	7.50	2						
Pleasant Grove	33	2,135	3,000	11.00			4		1	2	
Salt Lake City	607	44,843	70,000	8.67	37		23	6	12	7	18
Smithfield	15	1,080	1,800	8.33							
Springville	31	2,849	3,400	9.11	1		2			1	
Total	1,068		108,600	9.83	54		40	8	22	21	27
Vermont:											
Bakersfield	14	1,162	1,900	7.36							
Barnet	22	1,897	1,950	11.28							
Barre	121	6,812	7,000	17.29	11		15			4	2
Bennington	129	6,391	9,000	14.33	21		3			3	
Bethel	31	1,448	1,448	21.41	4		1				
Bradford	33	1,429	1,400	23.57	1		1				
Brandon	64	3,310	3,500	18.29	11		4	2			
Brighton	32	2,020	2,000	16.00	2					1	
Burlington	283	14,590	18,500	15.30	23		4			2	
Calais	21	1,082	1,000	21.00	1		2				
Cambridge	28	1,689	1,689	16.58	4						
Castleton	48	2,396	2,400	20.00	8						
Charleston	15	1,058	1,000	15.00	1						
Charlotte	15	1,240	1,300	11.54	1						
Concord	22	1,425	1,700	12.94	3						
Corinth	21	1,027	1,027	20.45	1		1		1		
Craftsbury	20	1,271	1,200	16.67	4		2				
Danby	8	1,084	1,000	8.00	2						
Dorset	17	1,696	1,700	10.00							
Essex	30	2,013	2,200	13.64	1		1				
Fairfax	19	1,523	1,600	11.88	4						
Fairfield	9	1,825	1,875	4.79	3						
Fairhaven	55	2,791	3,000	18.33	12		2				
Ferrisburg	23	1,501	1,500	15.33	5		2				
Georgia	25	1,282	1,300	19.23	4						
Hinesburg	17	1,205	1,205	14.11	1						
Jamacia	17	1,074	1,000	17.08							
Jericho	25	1,461	1,450	17.24							
Londonderry	20	1,010	1,010	19.80	2						
Lowell	17	1,178	1,178	14.42			1				
Ludlow	32	1,768	2,000	16.00	2				1		

¹ Typhus, 11.² Typhus, 1.

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Popula- tion, United States cen- sus of 1890.	Esti- mated popu- lation.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and mem- branous croup.	Whooping cough.
Vermont—Cont'd.											
Manchester.....	33	1,907	2,000	16.50							
Middlebury.....	54	2,793	2,800	19.29	4		2				
Morristown.....	51	2,411	2,500	20.40	12		1	1			
Mount Holly.....	14	1,214	1,100	12.71							
New Haven.....	16	1,224	1,260	12.70	1						
Norwich.....	18	1,304	1,300	13.85			1				
Orwell.....	15	1,265	1,300	11.54			1			1	
Pawlet.....	10	1,745	1,745	5.73				1			
Poultney.....	47	3,031	3,000	15.67	5		1			1	
Pownal.....	29	1,919	2,000	14.50	3		3			1	
Randolph.....	41	3,232	3,232	12.69	1					1	
Shaftsbury.....	22	1,652	1,650	13.33	1						
Shelburne.....	20	1,300	1,400	14.29							
Sheldon.....	16	1,365	1,400	11.43						1	1
Shoreham.....	12	1,240	1,300	9.23	3						
Springfield.....	55	2,881	3,500	15.71			2				
Thetford.....	15	1,287	1,200	12.50							
Topsham.....	12	1,187	1,200	10.00							
Troy.....	21	1,673	1,800	11.67	7		1				
Underhill.....	22	1,301	1,200	18.33	1		1				1
Wallingford.....	37	1,736	1,733	21.35	1			2		1	
Waterbury.....	53	2,232	2,800	18.93							
Westminster.....	20	1,265	1,265	15.81	1		1				
West Rutland.....	33	3,680	3,500	9.43	9						
Whitingham.....	17	1,191	1,200	14.17	2						
Wilmington.....	16	1,106	1,200	13.33	1						
Windsor.....	26	1,846	2,000	13.00	1		3				
Total.....	1,958		130,617	14.99	175		56	6	1	15	4
Virginia:											
Danville.....	316	10,305	20,000	15.80	38		10	1			3
Graham.....	20	1,021	1,800	11.11			2		4	1	
Leesburg.....	40	1,650	1,800	22.22	4		2		1	1	
Pocahontas.....	42	2,053	3,300	12.73	12		3				1
Pulaski.....	16	2,112	3,000	5.33	3				2	5	
Total.....	434		29,900	14.52	57		17	1	7	7	4
Washington:											
Blaine.....	7	1,583	1,500	4.67	2		1				
Chehalis.....	7	1,309	2,000	3.50	1						
Dayton.....	26	1,880	2,500	10.40	4			1		1	
Hoquiam.....	19	1,302	2,000	9.50	1						
Roslyn.....	23	1,484	2,300	10.00				2			1
Seattle.....	669	42,837	75,000	8.92	41		24	6	1	44	
Walla Walla.....	84	4,709	8,000	10.50	15		12		1	2	
Whatcom.....	33	4,059	6,000	5.50			2			1	
Total.....	868		99,300	8.74	64		39	9	2	48	1
West Virginia:											
Benwood.....	85	2,934	5,000	17.00	12					1	
Guyandotte.....	11	1,502	2,100	5.24	1		3	1		4	2
Keyser.....	93	2,165	3,000	31.00	3		7			2	
New Cumberland.....	30	2,305	2,700	11.11	3		3			3	
Wheeling.....	584	35,522	38,000	15.37	59		33	2	2	9	49
Total.....	803		50,800	15.81	78		46	3	2	18	51
Wisconsin:											
Algoma.....	10		1,800	5.56	1		1				
Alma.....	3	1,428	1,485	2.02						4	
Antigo.....	45	4,424	5,500	8.18	2						
Ashland.....	241	9,956	15,000	16.07	18		5			8	
Bayfield.....	10	1,373	1,500	6.67	3		1			3	
Beaver Dam.....	70	4,222	5,000	14.00	8		3				

MORTALITY STATISTICS OF 1,433 CITIES AND TOWNS, ETC.—Continued.

Cities or towns.	Total deaths from all causes.	Population, United States census of 1890.	Estimated population.	Annual mortality per 1,000 of the estimated population.	Deaths from—						
					Phthisis pulmonalis.	Smallpox.	Enteric fever.	Measles.	Scarlet fever.	Diphtheria and membranous croup.	Whooping cough.
Wisconsin—Cont'd.											
Beloit	72	6,315	10,000	7.20	7	—	3	—	—	1	—
Berlin	53	4,149	4,500	11.78	6	—	1	—	—	4	1
Black River Falls	20	2,261	2,000	10.00	3	—	4	—	—	—	—
Boscobel	23	2,570	2,000	11.50	1	—	1	1	—	1	—
Brodhead	22	1,461	2,000	11.00	2	—	1	—	2	1	—
Chippewa Falls	110	8,670	9,000	12.22	18	—	2	1	—	2	1
Cumberland	16	1,219	1,400	11.43	4	—	—	—	—	—	—
Delaven	27	2,038	2,300	11.74	5	—	—	—	—	4	—
Elroy	21	1,413	1,700	12.35	4	—	1	1	—	—	—
Fort Atkinson	27	2,283	2,700	10.00	5	—	1	—	—	—	—
Grand Rapids	16	1,702	2,400	6.67	3	—	—	—	—	—	—
Green Bay	225	9,069	24,000	9.38	30	—	9	1	—	3	—
Hayward	26	1,349	3,500	7.43	1	—	—	—	—	4	1
Horicon	12	1,354	1,500	8.00	1	—	1	—	—	—	—
Hudson	38	2,885	3,500	10.86	—	—	—	—	—	—	—
Hurley	55	2,267	3,500	15.71	—	—	—	—	—	1	—
Jefferson City	26	2,287	3,000	8.67	2	—	—	—	—	—	—
Kankana	50	4,667	7,000	7.14	5	—	—	—	—	2	—
Kenosha	169	6,532	12,000	14.09	16	—	1	—	1	11	1
Kewaunee	28	1,216	1,500	18.67	2	—	1	—	—	—	—
Lake Geneva	52	2,297	2,500	20.80	1	—	4	—	—	1	—
Madison	202	13,426	20,000	10.10	3	—	—	—	—	1	—
Manitowoc	161	7,710	11,000	14.64	—	—	—	—	—	1	—
Mauuston	13	1,343	1,800	7.22	3	—	—	1	—	—	—
Mazomanie	19	1,031	1,000	19.00	3	—	—	—	—	—	—
Medford	15	1,193	1,800	8.33	—	—	—	—	—	1	—
Menasha	182	4,581	7,000	11.71	—	—	—	—	—	—	—
Merrill	150	6,800	8,000	18.75	4	—	3	—	—	2	—
Milwaukee	3,338	204,468	280,000	11.92	316	—	46	2	2	61	53
Milwaukee, Mil. Co.	45	—	4,500	10.00	—	—	1	—	—	—	—
Mineral Point	28	2,694	3,500	8.00	6	—	2	—	—	—	—
Monroe	60	3,768	4,000	15.00	4	—	—	—	—	—	—
Neenah	120	5,083	6,000	20.00	14	—	—	—	—	—	1
New London	30	2,050	3,000	10.00	3	—	1	—	—	—	—
Oconomowoc	32	2,729	3,000	10.67	4	—	—	—	—	—	—
Oconto	50	5,219	6,000	8.32	5	—	—	—	—	—	—
Oshkosh	364	22,836	30,000	12.13	51	—	2	—	—	7	—
Peshtigo	23	1,719	2,300	10.00	3	—	—	—	—	—	—
Platteville	48	2,740	3,700	12.97	4	—	—	1	—	3	—
Plymouth	14	1,503	2,300	6.09	7	—	1	—	—	—	—
Prairie du Chien	80	3,131	3,500	22.86	11	—	—	5	—	—	—
Reedsburg	22	1,737	2,600	8.46	3	—	—	—	—	1	—
Rhineland	42	2,658	5,000	8.40	4	—	2	2	—	—	—
Rice Lake	47	2,130	3,500	13.43	4	—	1	—	—	4	—
Ripon	47	3,358	5,000	9.40	4	—	2	2	—	2	—
Shawano	20	1,505	2,000	10.00	2	—	—	—	—	—	1
Sheboygan	270	16,359	24,000	11.25	30	—	7	—	—	6	—
Sparta	29	2,795	3,800	7.63	3	—	—	—	—	—	—
Stoughton	29	2,470	3,700	7.81	7	—	—	—	—	—	—
Sturgeon Bay	36	2,195	3,500	10.29	2	—	1	—	—	—	—
Superior City	398	11,983	35,000	11.39	15	—	13	6	5	17	1
Toneah	25	2,199	3,000	8.33	1	—	—	—	—	—	—
Two Rivers	62	2,870	3,500	17.73	10	—	—	1	—	3	3
Waukesha	73	6,321	9,000	8.33	8	—	3	—	—	—	—
Wausau	114	9,253	13,000	8.77	5	—	3	—	—	1	1
Total	7,557	—	651,275	11.60	686	—	130	14	10	162	64
Wyoming:											
Cheyenne	75	11,690	9,000	8.33	—	—	—	—	—	—	—
Grand total	320,385	—	21,035,689	15.23	32,636	20	6,355	1,538	1,582	7,278	2,514

¹ Typhus, 1.

DIVISION OF INSULAR AND FOREIGN QUARANTINE AND IMMIGRATION

CUBA.

The transactions of the Service in Cuba were suspended during the Spanish-American war. At the close of the war work was resumed, and Sanitary Inspector W. F. Brunner was ordered to Habana, arriving there September 24, 1898, in accordance with arrangement made with the War Department as described on pages 693-694 of the annual report of this service for 1898.

At Santiago Sanitary Inspector Caminero was placed on duty immediately after the capture, and for a time acted as health officer under the military governor and inspected vessels.

December 24, 1898, a letter was addressed by the honorable Secretary of the Treasury to the honorable Secretary of War inviting attention to a memorandum prepared by the Surgeon-General of the Marine-Hospital Service relating to a quarantine service in the islands of Cuba and Porto Rico, and in accordance with the suggestions made therein the following orders providing for maritime quarantine, signed by the President, were promulgated by the War Department:

OPERATIONS IMMEDIATELY FOLLOWING THE CLOSE OF THE SPANISH-AMERICAN WAR.

EXECUTIVE ORDERS—QUARANTINE IN CUBA AND PORTO RICO.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, D. C., January 20, 1899.

By direction of the Secretary of War, the following orders of the President are published for the information and guidance of all concerned:

EXECUTIVE MANSION,
Washington, D. C., January 17, 1899.

To prevent the introduction of epidemic disease, it is ordered that the provisions of the act of Congress approved February 15, 1893, entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," and all rules and regulations heretofore prescribed by the Secretary of the Treasury under that act are to be given full force and effect in the islands of Cuba and Porto Rico, and the following additional rules and regulations are hereby promulgated:

The examination in ports of the islands of Cuba and Porto Rico of incoming and outgoing vessels and the necessary surveillance over their sanitary condition as well as of cargo, passengers, crew, and of all personal effects, is vested in and will be conducted by the Marine-Hospital Service, and medical officers of that Service will be detailed by the Secretary of the Treasury as quarantine officers at the ports of Habana, Matanzas, Cienfuegos, and Santiago immediately, and at other ports in the islands of Cuba and Porto Rico as soon as practicable or necessary. Quarantine officers shall have authority over vessels, their wharfage and anchorage in infected seaports, in so far as is necessary to prevent the infection of vessels or their personnel, and all vessels, including vessels of the army transport service and merchant and coastwise vessels, leaving ports in the islands of Cuba

or Porto Rico for the United States or for other ports in the islands of Cuba or Porto Rico, vessels of the United States Navy excepted. Quarantine officers will enforce necessary measures on incoming vessels through collectors of customs at ports of entry, who will not permit entry without quarantine certificates, and bill of health shall not be given to an outgoing vessel unless all quarantine regulations have been complied with. All officers of the army transport service and medical officers of the Army and Marine-Hospital Service on duty on army transports will use every precaution to prevent danger of exposure to infection of crews while in ports in the islands of Cuba or Porto Rico.

Since the quarantine service herein provided is for the protection of the islands of Cuba and Porto Rico as well as the protection of the United States against both, the expenses arising therefrom will be charged at present both against the revenues of these islands and the epidemic fund; said expenses will be divided equally against both, payments, however, to be made out of the epidemic fund and reimbursement made thereto from the revenues of the islands of Cuba and Porto Rico.

WILLIAM McKINLEY.

By command of Major-General Miles:

H. C. CORBIN, *Adjutant-General*.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, March 13, 1899.

By direction of the Secretary of War, the following order of the President, amendatory of General Orders, No. 15, January 20, 1899, from this office, is published for the information and guidance of all concerned:

“EXECUTIVE MANSION, *Washington, March 13, 1899.*

“Executive order of January 17, 1899, is hereby amended as follows:

“The third paragraph thereof requiring that the quarantine expenses of the islands of Cuba and Porto Rico shall be charged at present against the revenues of those islands and the epidemic fund is hereby amended to read as follows:

“On and after March 15, 1899, the said quarantine expenses in the island of Cuba shall be paid from the fund derived from the tonnage taxes of said island, as hereinafter specified. The proceeds of said taxes in the island of Cuba, not to exceed \$300,000 in each fiscal year, shall be set aside, and the quarantine expenses in the island of Cuba paid therefrom on certificate of a medical officer, detailed under Executive order of January 17, 1899.

“The quarantine expenses in the island of Porto Rico on and after March 15, 1899, shall be paid from the revenues of the island on certificate of a medical officer detailed under Executive order of January 17, 1899.

“WILLIAM McKINLEY.”

By command of Major-General Miles:

H. C. CORBIN, *Adjutant-General*.

DETAILS OF QUARANTINE OFFICERS.

On January 28, 1899, Surgeon Carter was detailed for service in Cuba, with the following instructions:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., January 28, 1899.

SIR: Having arrived in Washington, in accordance with telegraphic orders of January 23, 1899, you are hereby ordered to proceed to Habana, Cuba, and thence

to other portions of the island, the province of Santiago excepted, at such times as may be suitable. I have to inclose herewith a copy of General Orders, No. 15, issued from the Headquarters of the Army, Adjutant-General's Office, in Washington, dated January 20, 1899, embracing an order signed by the President relating to quarantine in Cuba and Porto Rico. You are hereby directed to organize the service contemplated in this Executive order in the ports of Cuba, the province of Santiago excepted.

You are directed first to call upon Maj. Gen. John R. Brooke, U. S. A., governor of the island of Cuba, with a view to securing his cooperation in the measures about to be instituted. Thereafter you will call upon each of the military governors of the several provinces of the island and also the military officers in command of the several ports, particularly General Ludlow, in command of the city of Habana, and Colonel Black, who has also been detailed by the President for duty in that city.

You will provide for the organization of the quarantine service first in the ports mentioned in the Executive order, with the exception of Santiago, to which port and province P. A. Surg. M. J. Rosenau has been detailed.

You are informed that the disinfecting barge *Protector* is to be towed within a few days to the harbor of Habana, and that the Bureau, in order to save time, has advertised for proposals to furnish some eight steam disinfecting chambers, with boilers and formaldehyde attachments, for use at the quarantine stations in Cuba. You will make a specific report to the Bureau concerning each port, recommending the kind of plant necessary—i. e., whether floating or stationary—and if stationary, its location, giving diagram, so far as possible, in illustration thereof.

You are informed that a disbursing officer of the epidemic fund is to be appointed by the Secretary of the Treasury for the island of Cuba. This disbursing officer will be directed to pay bills certified to by the regular quarantine officers appointed at the respective ports, when these officers are regularly commissioned officers of the Service, or by yourself.

While the Marine-Hospital Service is given the control of quarantine matters, including the payment of quarantine expenditures, it is the desire of the Bureau that the military governors of the several ports, as well as the military governors of the provinces, should be consulted with regard to the equipment and running expenses of the respective ports.

You will keep the Bureau fully informed by correspondence, or cable if necessary, of your procedures under this order, writing a letter at least once a week, and oftener if necessary.

That there may be no misunderstanding in the matter, you are informed that you are in charge of all-quarantine matters in behalf of the Bureau in Cuba, with the exception of the province of Santiago, the port of Habana included. Your status is that of inspector. Regular quarantine officers will be detailed by the Secretary. With regard to Habana, your attention is especially directed to the matter of the landing of troops from transports, and some measures devoid of danger from infection of yellow fever should be devised for such landing. Your attention is called in particular to the necessity of perfecting arrangements at Habana for preventing the conveyance of yellow fever from that port to the United States. These arrangements should be made and put in operation as soon as practicable.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

Surg. H. R. CARTER,

United States Marine-Hospital Service, Washington, D. C.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., February 1, 1899.

Dr. W. F. BRUNNER,

Sanitary Inspector, Marine-Hospital Service, Habana, Cuba.

SIR: I have to inclose herewith a copy of General Orders, No. 15, issued by the War Department, Headquarters of the Army, Adjutant-General's Office, January 20, 1899, which embraces an order signed by the President relating to quarantine in Cuba and Porto Rico, dated January 17, 1899. In accordance with this Executive order, by direction of the Secretary of the Treasury, you are hereby detailed as quarantine officer at the port of Habana. You are directed to confer with the military governor of the island, Gen. John R. Brooke, and also with the military governor of Habana, Gen. William Ludlow, with a view to securing their cooperation in the performance of your quarantine duties.

You are informed that Surg. H. R. Carter has been detailed as inspector for the purpose of making recommendations for the carrying out of the Executive order above named, and you are directed to confer with him as the representative of the Surgeon-General of the Marine-Hospital Service in Cuba.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

Approved.

L. J. GAGE, *Secretary.*

TREASURY DEPARTMENT,
Washington, D. C., February 1, 1899.

SIR: In accordance with the President's order of January 17, 1899, included in General Orders, No. 15, of your Department, dated January 20, 1899, I have to inform you that P. A. Surg. M. J. Rosenau has been detailed as quarantine officer for the port of Santiago de Cuba, and has been instructed by the Surgeon-General of the Marine-Hospital Service to confer with Gen. Leonard Wood, military governor of the province. Also that Sanitary Inspector W. F. Brunner has been detailed as quarantine officer for the port of Habana, Surg. A. H. Glennan as quarantine officer at the port of San Juan, P. R., and Asst. Surg. C. H. Lavinder as quarantine officer for the port of Ponce, P. R. All of these officers have been directed to confer with the military governors of the respective ports and provinces.

Respectfully, yours,

L. J. GAGE,
Secretary.

The SECRETARY OF WAR.

Sanitary Inspector W. F. Brunner, after rendering valuable service at Habana, resigned June 30, 1899, to accept the position of health officer of Savannah, Ga. Surg. H. R. Carter was then detailed as quarantine officer at Habana under the Executive Order, January 17.

It is proper here to mention the patriotic service of Dr. Brunner at Habana immediately prior to the outbreak of the Spanish-American war, in obtaining at great personal risk plans and details of the harbor defenses of Habana. These were forwarded to the War Department and were the basis of the official maps published and used in the preparation of offensive campaign measures.

Past Assistant Surgeon Rosenau was recalled from Santiago in May,

1899, his services being required as director of the Hygienic Laboratory in Washington. He was succeeded by Asst. Surg. H. B. Parker.

Under the foregoing orders the quarantine service was established as rapidly as possible at the most important ports, but in July, 1899, it became necessary to perfect the system in Cuba, and P. A. Surg. Rosenau was ordered on a tour of inspection of all the ports of entry. He was supplied with ten autoclaves for generating formaldehyde gas, also with a supply of formalin, bichloride of mercury, sulphur, and vaccine points for distribution to the various stations. His reports from the stations visited were published in the Public Health Reports. Following are his orders and a brief summarized report:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., July 19, 1899.

P. A. Surg. M. J. ROSENAU,

U. S. Marine-Hospital Service, Washington, D. C.

SIR: In accordance with Executive orders of January 17, 1899, and March 13, 1899, you are hereby detailed as inspecting quarantine officer for the island of Cuba.

Your duty will be to inspect the quarantine stations which have already been established in that island, and to visit the smaller ports where as yet no provision has been made for such stations.

In view of the fact that communication with many of these ports by rail is impossible, and impracticable by the ordinary means of travel, you are informed that the quarantine steamer *Dagmar* will be placed under your command for the purpose of expediting this inspection.

It having already been provided in the last Executive order that the quarantine expenses in the island of Cuba shall be paid from the revenues of the island, and a definite sum having been set aside therefor, you are informed that all the expenses of this inspection trip will be chargeable to this fund, and the disbursing officer of the Marine-Hospital Service at Habana will be directed to pay bills incurred while on this temporary duty when certified to by yourself.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General, M. H. S.

Approved: L. J. GAGE, *Secretary of the Treasury.*

EXECUTIVE MANSION, *July 19, 1899.*

Approved: WILLIAM MCKINLEY.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., July 19, 1899.

SIR: Referring to Bureau letter of this date, detailing you as inspecting quarantine officer for the island of Cuba, you are hereby directed to proceed immediately to Habana, Cuba, and upon arrival to confer with Surg. H. R. Carter, U. S. Marine-Hospital Service.

After this conference, you will proceed to all the minor ports in the island of Cuba where no quarantine establishments have as yet been put in operation by this Service, and you will investigate very thoroughly the needs of such minor stations, both as to the means of exclusion of extraneous disease, and those to prevent the emission of epidemic disease from these ports themselves in the event of their becoming infected.

You will nominate acting assistant surgeons for duty at all ports where the services of such officers are needed, and will fully instruct each as to his duties, professional and clerical, and as to what rights and limitations are his under the regulations.

Each acting assistant surgeon should be as fully as possible instructed in methods of disinfection, and more particularly of such methods as may be used in the absence of recognized appliances.

Inclosed is a list of the quarantine divisions of the island with the names of the medical officers in charge of each division.

You should confer with them and instruct acting assistant surgeons, nominated by you, to make their reports to these officers, and obtain from them the necessary authority for all expenditures

Bills and pay rolls from the various ports must be approved by the division officers and forwarded by the latter to the disbursing agent in Habana, Mr. F. P. Ferris.

The steamer *Dagmar* will be sent to Habana and placed under your complete control. Disinfecting apparatus and disinfectants, stationery and blanks, so far as possible, and quarantine literature will be supplied for distribution at the several ports.

You will keep accurate record of all the property and make a complete report at the end of this detail, making special reports when necessary from the several ports. You should keep the Bureau informed, as far as possible, with regard to your movements, communicating frequently.

It is desired that all the small ports not heretofore investigated shall be visited as promptly as possible.

When this duty is complete, you will wire from the most available port for further instructions.

Very respectfully,

WALTER WYMAN,
Surgeon-General, M. H. S.

P. A. Surg. M. J. ROSENAU,
U. S. Marine-Hospital Service, Washington, D. C.

NOTE.—The *Dagmar* being out of commission could not be prepared in time, and was not used.

REPORT OF P. A. SURG. M. J. ROSENAU.

TREASURY DEPARTMENT,
MARINE-HOSPITAL SERVICE,
Washington, D. C., December 29, 1899.

SIR: Complying with instructions, I have the honor to submit herewith my report on the inspection of Cuban quarantines.

I visited all the ports of Cuba in compliance with orders of July 19, inspected the existing quarantines, and established a quarantine inspection service at several of the minor ports.

I was enabled to comply with the spirit of my orders, but am unable to give a detailed report for each port, for the reason that my trip was very much hurried on account of the lack of transportation facilities, which were to be furnished by the Department. At some ports I remained only a few hours.

As a result of this inspection, I have the honor to make the following recommendations:

1. As far as quarantine is concerned the island of Cuba should be treated as a unit, and for this purpose—

2. The entire charge of quarantine affairs of the island should be in the hands of an officer of the Service stationed at Habana, but privileged to go to other parts of the island as occasion may require.

3. There should be a complete quarantine equipment at the principal ports of Cuba from which passenger vessels leave for the United States. These are five, namely, Habana, Matanzas, Nuevitas, Santiago, and Cienfuegos.

Respectfully submitted.

M. J. ROSENAU,

Passed Assistant Surgeon, Marine-Hospital Service, Director.

SUPERVISING SURGEON-GENERAL, MARINE-HOSPITAL SERVICE.

COMPLETED QUARANTINE ORGANIZATION IN CUBA.

Following is the completed organization under Executive order of January 17, 1899: The island of Cuba has been divided into five divisions, each with a chief quarantine officer at the principal port in charge of the officers at the subports.

First division: Provinces of Pinar del Rio and Habana, both coasts. Ports: Habana, Batabano.

Second division: North coasts of the provinces of Matanzas and Santiago. Ports: Matanzas, Cardenas, Sagua la Grande, Caibarien.

Third division: North coasts of provinces of Puerto Principe and Santiago. Ports: Nuevitas, Gibara, Mayari, Padre, Banes, Baracoa.

Fourth division: South coast of province of Santiago de Cuba. Ports: Santiago, Daiquiri, Guantanamo, Manzanillo.

Fifth division: Southern coasts of the provinces of Santa Clara and Puerto Principe. Ports: Cienfuegos, Tunas, Santa Cruz, Casilda.

REPORTS FROM UNITED STATES QUARANTINE STATIONS IN CUBA.

There are here appended the reports of the work conducted in the five divisions of the island of Cuba.

REPORT FROM QUARANTINE STATION AT HABANA.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

HABANA, CUBA, *November 1, 1899.*

SIR: I have the honor to inclose herewith a report of the transactions of this station for the fiscal year ended 30th June, 1899. The detail to write this report was given me by P. A. Surg. M. J. Roseneau, then medical officer in command, as I was the only one on continuous duty at this station during the past year.

It is unfortunate that this report could not have been written by Surg. H. R. Carter, or Sanitary Inspector W. F. Brunner, who were both well informed as to the transactions of the Habana station, and could have furnished much interesting data which is not within my knowledge.

The interruption of the work of this station caused by the war, and the many changes which have necessarily been made, due to unprecedented conditions suddenly arising, naturally make this report disconnected and incomplete. I have tried to describe the working of the station, and to give the data required, as requested by the Bureau's letter of the 14th September, 1899.

Respectfully yours,

D. E. DUDLEY,

Acting Assistant Surgeon, U. S. M. H. S.

Respectfully transmitted.

G. M. GUITERAS,

Passed Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,

Washington, D. C.

HABANA, CUBA, November 1, 1899.

SIR: The operations at Habana were suddenly interrupted by our war with Spain during the summer of 1898. The United States Marine-Hospital Service office at this port was closed from April 10 to September 24, 1898. It would, therefore, seem not out of place in writing a report of the Habana station for the fiscal year to give a short and descriptive account of what occurred just prior to our departure from Habana.

From the time of the disaster to the United States battle ship *Maine* until we left Habana the office of the United States Marine-Hospital Service was besieged from early morning until sundown by people of all classes who were trying to escape from a city that was apparently about to be bombarded. The personnel of the Marine Hospital Service force at this port then consisted of but four people, viz, Sanitary Inspector W. F. Brunner, in command; Sanitary Inspector D. E. Dudley; Louis Espinosa, clerk, and Ramiro Arocha, a boatman.

The volume of work carried on by the service at this time, if fully described in this report, would hardly be credited. In the harbor the daily inspection and clearance of newspaper dispatch boats alone would almost represent to-day a normal day's work for the boarding officer. Merchant vessels of every description were coming and going, as, war being imminent, ships were anxious to improve their opportunity in supplying a city, which was soon to be blockaded, with provision and merchandise.

Passenger steamers for the States left here daily with a large number of people. The American consulate was providing for the transportation of hundreds of homeless people, American and Cuban, and it was necessary for the officers of this service to be doubly diligent, as these classes were such as were most exposed to infectious and contagious diseases. It was only by the utmost watchfulness of your well-nigh exhausted officers that the diseases common to Habana were not introduced into the States at this time.

At the office a panic-stricken crowd of several hundred people, from the wealthiest and most influential Cubans and Spaniards to the most poverty-stricken families, were pushing and struggling with one another to secure certificates of health that would entitle them to tickets for transportation.

The sanitary conditions of the city were as bad as it was possible for them to be. Smallpox and yellow fever were widespread and it was only by a stern sense of duty that we were able to lock our hearts against the sentiments of humanity and refuse permission to many who, had they been allowed to proceed to the United States would certainly have been the means of starting a most terrible epidemic. A letter directed to the Bureau on April 8, 1898, by Dr. Brunner best illustrates the situation. He says:

"In transmitting the report of this office for the week, I would state that the personnel of the service is exhausted by overwork.

"Until Tuesday, April 5, 1898, when the quarantine regulations were modified by instructions from the Bureau, a panic-stricken crowd daily besieged this office for vaccination and acclimation certificates. In the absence of police protection, physical force was necessary to preserve reasonable order. At one time the frantic crowd smashed in the doors, and considerable force was necessary to restore order.

"I have observed the greatest care in all other sanitary matters, and those persons going without vaccination or acclimation certificates have been inspected at gangways of vessels and given observation certificates.

"I shall continue to perform the sanitary work in its every detail until recalled."

On April 5, 1898, your cable announcing that "quarantine inspection at Habana is hereby suspended; inspection will be performed on this side," was received, and soon after another, in which you instructed us to leave Habana when necessary and proceed to Tampa. From this time on passengers were inspected on board vessels just prior to their departure. Every vessel left crowded with refugees, and

the fear and panic of the people during these terrible days reached a point of almost dramatic intensity.

During the last weeks of our stay in Habana we were almost cut off from communication with the outside world; the mails were carefully guarded by the Spanish authorities. Newspapers from the United States were prohibited sale, and it was almost impossible for us to know or learn anything of the situation of affairs.

We left Habana April 9 on twelve hours' notice. At that time hacks and vehicles of every description were prohibited on the streets, and it was with the utmost difficulty that anyone could get luggage from hotel or residence to the steamer. Our departure from Habana was without incident. We landed in Key West early the next morning, where we were met by a brass band and several hundred American citizens who could not speak our language.

CONDITIONS IMMEDIATELY AFTER THE WAR.

A few days after the Cuban blockade was raised I was ordered to proceed to Habana and resume the duties of my station. Accordingly, I secured passage on the schooner *Ellen H. Adams*, had my baggage placed on board, and was ready to sail at 3 a. m. At midnight the order was revoked, on account of a riot reported to be in progress in Habana by certain newspaper men who had just entered the port and were refused permission to land. The schooner with my baggage left without me. The latter was held up by the Spanish custom-house. Being much more apprehensive regarding my trunks than I was of any Habana riot, I wired the Bureau for permission to go, stating my opinion regarding the conditions in that city.

In shipping circles pandemonium broke loose, and a most sensational maritime race to Habana took place, in which every description of vessel that could get clearance and could carry a ton of provision became engaged. The Ward Line of steamers was one of the first of the large American passenger lines to reestablish communication, and was quickly followed by the Plant Line.

On account of health conditions in Key West I was ordered by Surg. A. H. Glennan to accompany the *Mascotte* on each of her trips and carry out the regulations for the inspection of passengers and baggage. This detail was carried out until the arrival of Sanitary Inspector W. F. Brunner in Habana, September 24, 1898, when the office of this service was again formally opened.

The condition of the pauper people and reconcentrados after the blockade beggars description, and the sanitary condition of the city was at its worst.

Dr. Brunner's report to the Bureau after our return furnishes the best description of the situation in the city, part of which I quote:

"The physical condition of the country people—I refer to the reconcentrado classes—is appalling. A conservative estimate would place 50 per cent as permanent physical wrecks. The cost of living exceeds that for the period immediately before the war. Work is not obtainable, and these people are in the last stages of elimination for want of food. * * * The city is even dirtier than before, if such a thing could be possible. * * * Malarial fever in fatal forms exists to a great extent; the natives seem to suffer very much and to furnish over one-fifth of the total deaths for the week."

The mortality table which accompanied this report gave the total deaths from all causes for the week ended October 6, 1898, as 536.

Yellow fever and smallpox were not so widespread as they had been, the drop in the mortality from the first-named disease being due to a lack of fresh material for it to feast on.

Very few Spanish soldiers were brought here from January 1 to April 21, 1898, the latter being the day when Habana was closed to the outside world, and, moreover, about all the troops then present had become immunes. As American people began to pour into the city the disease increased accordingly. During the

first six weeks after the port was opened there were four deaths from yellow fever among the American visitors.

The history of the American bark *Maryland*, in port at this time, is of interest. She was an old Cuban trader, and was captured during the blockade. Two speculative Americans bought her from the Government, stocked her with meat and other provision, and sailed in her for Habana, arriving about the middle of August. She had a crew of eight. She discharged her cargo at the Caballeria wharf, consuming a period of several weeks—her owners and crew slept on board—and finally anchored in the open bay. Yellow fever developed, taking for its first two victims the owners. The captain was next taken sick, and died on October 5. The crew were next taken sick, two of whom were removed to the hospital, and finally, out of a complement of 10 persons, but three remained well on board. A new captain was sent down, and an effort—which, on account of the bad history of the vessel, was a long time in producing results—was made to secure a new crew. The new captain complicated matters by going on a protracted spree and refusing to sail. In the latter part of October, however, he sailed for Tortugas, arriving there after an interesting voyage of nineteen days.

The U. S. cruiser *Resolute*, with a military commission on board, arrived in Habana in the early part of September. This vessel became infected in October, and two officers died of yellow fever. The vessel was anchored in the open bay all of the time she remained in port, but her officers were allowed shore leave, and the infection was confined to the officers' quarters. In accordance with the advice of Dr. Brunner, the vessel was sent to Tortugas for thorough disinfection. She returned to Habana and remained in port several weeks. No other cases were reported.

The greater number of deaths from yellow fever occurred, of course, in the military hospitals. As the date of the evacuation of the Spanish forces drew near these troops were called in from all parts of the island to Habana and were placed in the sugar warehouses along the water front to await embarkation. The condition of these returning troops was pitiable in the extreme. The vast majority of them had suffered or were suffering from malarial fever and dysentery, and all showed signs of suffering from exposure and the want of proper nourishment.

In the Catalina warehouse, on the Regla side—a building which was used as a yellow fever hospital—hundreds of these men were quartered. Fully 7,000 soldiers were occupying these buildings, and all the evils of overcrowding, particularly by such a number of sick and impoverished people, together with the utmost indifference as to the exercise of sanitary care, soon became manifest. Disease carried off many hundreds of these unfortunates. The wharfs in front of the buildings were reeking with filth and the excreta of several thousand sick men. A number of vessels lying at the wharfs discharging coal became infected, and masters of such vessels were finally compelled to protest to their agents against discharging at these wharfs. With such conditions along the water front, and the large number of vessels then in port with nonimmune crews, it seems but little short of miraculous that a larger number of vessels were not infected.

Malarial fever and intestinal diseases caused the deaths of a larger number of people than any other two diseases. The native population suffered as much as the military. There was not hospital room sufficient for a fifth of these cases. Medicine in sufficient quantities could not be obtained, and proper diet was out of the question. The death rate from malaria was so large in October as to call for special mention in a report to the Bureau by Dr. Brunner. Quoting a part of this report, dated October 28, 1898:

"I can not refrain from advocating and urging an investigation of the malarial fever which has caused a mortality of over 300 since October 1. The records of this office do not show such a death rate from malarial fevers during any previous years, and, in view of the fact that American troops will soon be stationed in and around the city, it is most important that these cases should be especially investi

gated, and if true malaria, the causes be ascertained and removed, which have produced them so much more extensively than they have occurred in other years, and in such fatal form. It is not altogether clear to me that these cases, at least all of them, are malarial fever. Certain it is that there is a fever which prevails here that attacks natives and foreigners alike, and which is intensely fatal. I have not the time to do more than observe the general health conditions, and can not speak except in a general way, but the question deserves scientific investigation at once, if the United States is going to place troops here."

The reconcentrado class suffered cruelly. They lived in the streets; they were sick and starving in the streets; and the greater part of them died in the streets. The condition of the city can readily be imagined under such circumstances. Almost every variety of disease could be found among this homeless class of people. I once found a beggar, convalescent from smallpox, sitting on the steps of a store in our principal business street, diligently picking off the dried scabs from his person. The excreta of these people, and of hundreds of those who had homes, lined the sidewalks and streets, and it was astonishing to note the indifference shown by the people to these conditions. Such was the condition when the first of the United States troops arrived.

Abortive attempts were made in the early spring of the year to clean up the streets. Where water mains were within reach, the fire department was called out to flush the sewers, and a large amount of good water was wasted. Instead of pumping into each manhole, or catch-basin, at the head of the sewers, and pumping to the outlet, a stream of water was merely played on the surface of the street and the water allowed to drain into the sewer. On other streets, boys were employed with small tin garden sprinklers and brooms made of switches tied together. The method was as ludicrous as it was ineffectual. As soon as our Government was able to provide for the large number of beggars and homeless sick, and a street-cleaning department organized, real progress was made, and by May the city was mechanically clean.

A plant for the manufacture of electrozone has been erected, and this agent is largely used by the street department, which seems to be much impressed with the results obtained. The sanitary authorities of the city claim it to be a marvelous disinfecting agent, and highly commend its virtues. This service has had no opportunity to test its efficacy, and is not in a position to discuss its merits. Electrozone certainly possesses two properties which I consider valuable. First, it has a distinct odor, and then, like water, it is wet. If used in sufficient quantities, ignoring, of course, the expense of manufacture, I would regard the agent most useful for flushing streets and sewers and washing down buildings.

The following mortality table for the year is of interest:

	1898.						1899.						
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Total.
Yellow fever	18	21	23	32	15	12	5	1	2	2	1	1	132
Enteric	87	127	136	150	116	123	46	18	26	21	27	23	900
Pernicious	41	41	38	131	70	76	30	18	12	10	6	9	482
Malarial	36	105	117	357	232	236	163	71	57	45	40	29	1,538
Dysentery	89	104	107	131	123	98	25	11	12	4	1	3	708
Enteritis	209	302	286	306	274	286	241	126	115	78	75	76	2,374
Diphtheria	2	2	1	2	5	2	4	6	1	4	1	2	32
Smallpox	1	6	2	1	1	1	1	1	1	1	1	1	12
Beriberi	2	1	1	1	1	1	1	1	1	1	1	1	4
Glanders	1	1	1	1	1	1	1	1	1	1	1	1	3
Starvation	37	49	44	4	5	5	3	3	4	1	1	1	155
Pneumonia	26	25	21	19	26	31	30	12	16	25	33	28	292
Tuberculosis	232	247	258	257	228	206	187	166	170	103	88	84	2,226
Total deaths from all causes.	1,362	1,727	1,638	2,445	1,959	1,771	1,205	797	788	612	629	629	15,562

OPERATIONS DURING QUARANTINE.

The sanitary work as carried out by the Service at this station during quarantine can be comprised under nine heads:

1. Boarding and inspection of vessels from foreign and infected home ports.
2. Inspection for health, vaccination, and immunity to yellow fever of all passengers going to the United States.
3. Inspection of all outgoing vessels bound for ports in the United States and its dependencies.
4. (a) Disinfection and inspection of all passengers' baggage requiring same; (b) disinfection of all mail for Southern States; (c) disinfection and inspection of all express matter and freight requiring same.
5. Disinfection by barge *Protector* of all vessels bound for such ports as require disinfection of same.
6. Inspection of cargoes and ballast.
7. General supervision of Habana Harbor sanitation.
8. Medical assistance to American sailors not requiring hospital care.
9. Inspection of vessels engaged in the cattle trade.

1. The boarding and inspection of vessels from foreign and infected home ports is performed by two medical officers especially detailed for this part of the work, and who have their offices on the water front at the Capitanía del Puerto. Pilots boarding such vessels instruct the captains to fly the quarantine flag.

Inspection is made of the crew, passengers, and vessel, and a report made to the medical officer in command.

Since the appearance of plague in Portugal and Spain special precautionary measures have been taken in the treatment of the French and Spanish trans-Atlantic boats. The passengers and vessel are in each case carefully inspected by several officers of the Service, and a guard placed on board to carry out regulations and watch baggage, the latter being sent to the barge *Protector* for disinfection previous to landing.

The same precautions have been taken in the case of vessels coming from Vera Cruz, Mexico, and other infected ports. The inspection by officers of the Marine-Hospital Service of incoming vessels was inaugurated January 1, 1899. There were inspected from January 1 to June 30, 543 vessels. Smallpox was found on two vessels from Spain, viz, *Buenaventura* and *La Navarre*, and both vessels were quarantined. A suspicious case of yellow fever was found on the steamship *Buenos Ayres*, from Vera Cruz, and the vessel held in quarantine while in port.

The necessity of a well-equipped quarantine station for the detention of passengers became evident during the detention of the two vessels with smallpox on board, for passengers had to be removed and detained on schooners hurriedly chartered for the purpose.

2. The inspection of passengers is carried out at the United States Marine-Hospital Service office, located on Mercaderes street, by the medical officer in command and other officers on duty. Passengers are first examined for general health and vaccination.

Since January there has been very little smallpox in the city and no cases have been recorded for months, so that at present passengers going from here to the United States are only required to show that they are protected from smallpox by successful vaccination. During 1897 and 1898 smallpox was widespread in the city, and passengers were required to have recent and successful marks of vaccination, and for this reason many thousand people were vaccinated and revaccinated by the Service here. Certificates showing good health and protection from smallpox are given after this inspection for those going to New York and other States except Florida. During quarantine months only such passengers as are really immune to yellow fever can go to Florida ports. Proofs of immunity as

furnished by these passengers are carefully considered by the medical officer in command and an officer detailed for this special work. Proof of long residence of at least ten years in an endemic focus, or proof of previous attack of the disease, is accepted by this office. It has always been necessary to give most careful consideration to applicants for immune certificates, especially regarding statements of previous attack of the disease. Preference is given to proof of long-continued residence, as such proof can be made positive.

During the fiscal year there were vaccinated by this Service 1,642 passengers, and 17,823 passengers applied for certificates to go to the United States.

3. The inspection of out-going vessels bound for ports in the United States and its dependencies is under the charge of two officers of the Service. Captains of such vessels apply on the day of intended departure to our office for bills of health, and the data regarding the vessel is filled in on the bills of health by a clerk and turned over to the boarding officer. The vessel, crew, cargo, and ballast are then carefully inspected, and if all is well the facts regarding the sanitary condition of the vessel and crew are then filled in by the officer and the bills of health signed. In 1897 and 1898 the crews were invariably examined for vaccination, and vaccination was performed when required. Most vessels leaving this port are either in ballast or have swept holds.

The character of the ballast is always carefully considered. Soft, porous rock is rejected, and in several instances we have been obliged to compel the discharge of such ballast before leaving. Specimens of hard, nonporous rock are kept on exhibition at this station, so that captains of vessels can always inform themselves as to the kind of rock ballast that they will be permitted to carry. This ballast is easily obtainable at a cost of about \$2 a ton delivered. During the fiscal year there were 1,042 vessels inspected and cleared.

The passenger boats plying between Habana and Florida ports require and are given special inspection before sailing, and are kept under constant observation while in port during the quarantine season. These mail steamers are allowed to make their regular weekly trips under certain conditions, and it is these conditions that require the vessel to be under such careful and continuous observation: (a) The vessel must only enter the port after sunrise and must leave the same day before sunset; (b) she must be built of iron; (c) she must moor at a buoy in the open bay (the position in the harbor of said buoy is designated by the Marine-Hospital Service); (d) she must carry a crew immune to yellow fever and they must have no communication with the shore; (e) only immune passengers can take passage. Violation of one of these conditions subjects the vessel to quarantine. The steamer on arrival is immediately boarded by an officer of the Service and a guard posted on board. Only the agents, stevedores, and such men as are absolutely needed to conduct the business of the vessel are allowed on board. The stevedores are natives of the place, and are, of course, immunes. I have seldom seen a change made in the personnel of the stevedore crew.

All baggage, mail, and express matter is thoroughly disinfected and so labeled previous to being placed on board. It is the duty of the guard to see that no one leaves the ship, and that no one outside of the immune passengers with certificates and those authorized go on board. He is on the lookout for undisinfected packages that may be smuggled aboard, and sees that all the baggage bears our "Disinfected" labels; and it is his further duty to keep the vessel's side clear of all boats. At first some difficulty was experienced in handling "bum boats" doing business alongside these vessels, so that Surg. H. R. Carter found it necessary to prohibit such boats alongside. The "bum boat" business became a question of paramount importance, as the Florida vessels found it difficult to keep a crew while the prohibition existed. Surgeon Carter then modified the regulations he had made by allowing only one "bum boat" alongside, said "bum boat" to be chosen by the captain. It is required of the boatman that he first undergo

inspection of his boat and wares. He is then given a certificate allowing his boat alongside. This certificate the guard on board takes up each day just before the sailing hour. An inspection of all freight carried by these lines is made and a certain class is prohibited, viz. household goods, empty beer barrels, which are usually kept in such cafes and warehouses as are also used as living quarters for employees. At present beer barrels are allowed shipment after disinfection by the Service.

An hour before sailing time the vessel is boarded and thoroughly gone over, the crew mustered and certified to as to their immunity. Passengers are again inspected, their certificates taken up and compared with the passenger list of the vessel. Staterooms and cabins are thrown open and examined for possible smuggled disinfected packages. The sanitary condition of the vessel is carefully watched; the 'tween decks are required to be washed down every trip. The watch on the vessel is kept up until the last moment, and we leave the vessel as she gets under way.

4. The disinfection of passenger baggage is performed by the barge *Protector*, and the inspection is carried on at the land plant. Passengers applying for health certificates at the office are instructed regarding this requirement. If going to points south of the southern boundary line of Maryland, their certificates are marked "baggage to be disinfected," whether going via Florida or New York. Bedding and household goods are prohibited if going to Florida. This class of baggage is taken to our land plant, on the Cabellaria wharf, and turned over to a baggage master, who issues a check for each piece. It is then sent to the *Protector* for disinfection. The baggage is sealed and sorted for the different boats, and is delivered by us to the passenger on board and the claim check taken up. Passengers going to northern points have their health certificates stamped "Baggage to be inspected," after signing a pledge to the effect that they will not go south of the southern boundary of Maryland for thirty days. The baggage is inspected at the wharf, and if found to contain no prohibited material is labeled "Inspected and passed" and allowed to pass on board the vessel. Exception is made to this rule in the case of baggage going north via Florida. It is required that this class of baggage be not opened or handled by the passenger while it is in transit through the Southern States. The transportation companies seem unable to cooperate with us in carrying out this regulation. It is possible under existing conditions for a passenger bound north to stop over in Florida and gain access to his baggage. It was therefore deemed prudent to disinfect all baggage bound north going through Florida, which is now done. This baggage is always disinfected by the *Protector*.

4. (a) Disinfection of mail for the Southern States is performed by the land plant, and formaldehyde and dry heat is used exclusively for this purpose. Mail matter is placed in the wire cages, and then run into the cylinder and exposed for one hour at 180° F. Mail sacks are also disinfected and are sealed up with our seals, so as not to be opened before the expiration of twenty-four hours.

1. (b) Disinfection and inspection of freight and express matter is also done by the land plant. Waybills of freight are submitted to our office for approval, and any freight liable to convey infection is rejected, or disinfected when practicable. All fabrics sent by express are disinfected if consigned to the Southern States.

5. The *Protector* since her arrival at this port has disinfected a great many vessels and a large amount of baggage. Surg. H. R. Carter, while in command of this station, once stated that the *Protector* performed more disinfection than any plant on earth. Vessels are required to go alongside the barge *Protector*, where they are disinfected as thoroughly and with the same technique as at other stations of the service. The *Protector* is under the direct charge of Assistant Surgeon Ramus, M. H. S. Her disinfecting plant is of the most modern and

approved type, and she is too well known by her work here and at Montauk Point to require any description in this report.

Most of the baggage requiring disinfection is disinfected by the *Protector*, and demands are constantly made on her for special work, such as disinfection of buildings for the Navy, etc. Since she has been in commission at this port she has treated 198 vessels, 1,035 trunks, 1,622 valises, and 2,450 miscellaneous articles.

6. Inspection of cargoes and ballast: This inspection is made owing to the fact that a certain class of cargo is, under certain conditions, prohibited. Baled goods done up in burlap, if stored in buildings used as dwellings, are considered unsafe, and cargoes of sugar are always inspected at the warehouses.

Ballast is inspected either in the vessel's hold or on the lighter previous to loading, and soft, porous rock is rejected.

7. The harbor and all infected foci are kept under observation, and masters of vessels are kept informed as to what sections of the harbor are to be avoided. The sanitary conditions of the vessels themselves while in port are constantly under our observation. Cases of sickness on board are brought to our notice, so that any infectious or contagious disease may be at once detected and removed to hospital. Medical assistance to those not requiring hospital care is given whenever possible.

The importation of cattle to Habana became so important an industry, and the opportunities for violating the sanitary laws became so great as to require special regulations for the treatment of such vessels. Every available craft that has floating qualities seems to be employed in bringing cattle to Habana. Several small Key West schooners have been employed in the trade during the last two years, and owing to their fearfully unsanitary condition, and the inborn aversion to cleanliness possessed by crews manning these boats, the vigilance of your officers at this station has been greatly taxed.

The great bulk of the cattle business is conducted by the Munson Line, employing some 20 steamers, making regular trips, and importing about 50,000 head of cattle every week.

Florida, Texas, Tampico, and Bocas del Toro furnish most of the cattle for this port. The vessels are required to make frequent and quick trips, discharge their cattle immediately on arrival, and leave the same day. As a matter of course, they were mechanically foul when leaving this port, and it was found that in many instances no attempt was made to clean ship. Every available space on these ships was utilized, and on many of them overcrowding was permitted, as was shown by the loss of many animals by crushing and the want of sufficient air space. Cattle were carried in the hold, between decks, and on deck. Grated floorings were placed on the decks to protect the woodwork, and the space thus formed was seldom cleaned out.

These vessels are now kept under observation while in port. The masters are required to have the whole ship thoroughly washed down on her return trip for cattle. This cleaning up is certified to by certificate from either the American consul, collector, or sanitary inspectors, and is demanded at this port. Vessels failing to comply with this regulation are disinfected here before departure.

Pilots are allowed to clear these vessels only on the presentation by the captain of one of our certificates, stating that the boat is in good sanitary condition.

In concluding this report I may state that many of the regulations, especially those relating to the treatment of cattle vessels, the inspection of passengers and vessels from Cuban ports, etc., were devised by Surg. H. R. Carter, U. S. M. H. S., who had always in view the safety and welfare of all classes.

Sanitary Inspector W. F. Brunner, U. S. M. H. S., who was in command of this station until June 30, 1899, resigned his position on that date, and the Service lost a most able officer and gentleman.

Respectfully, yours,

D. E. DUDLEY,
Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure No. 1.]

Report of work done by barge Protector from April 1 to October 31, 1899.

Month.	Vessels.			Baggage disinfected.			
	Disinfect- ed.	Inspect- ed.	Total.	Trunks.	Valises.	Miscel- laneous.	Total.
April.....	33	—	33	—	—	216	216
May.....	16	—	16	—	—	633	633
June.....	11	—	11	—	—	177	177
July.....	5	—	5	87	202	129	418
August.....	34	6	40	244	342	232	818
September.....	27	13	40	386	586	277	1,249
October.....	21	32	53	318	492	786	1,596
Total	147	51	198	1,035	1,622	2,450	5,107

DISINFECTED.

Rooms of buildings on shore, Habana	104
Barracks " Machina."	
Diario de la Marina building.	
Marine hospital laboratory.	
Admiral's (U. S. N.) quarters.	
Arsenal officers' quarters.	
Store, 67 Del Monte street.	

[Inclosure No. 2.]

Shore disinfecting plant.

DISINFECTED.

	Pieces.
Baggage, etc.	1,564
Mail matter from September 19 to October 31, 1899:	
Bags of mail disinfected	700
Bags of empty sacks	151
Inspected and passed, bags (foreign)	111
Meat boxes	1,200
Beer barrels	3,700
Newspaper boxes	100

REPORTS FROM QUARANTINE STATIONS AT MATANZAS, AND SUBPORTS.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Matanzas, Cuba, October 1, 1899.

SIR: I have the honor to submit the following report of the quarantine service at Matanzas and the subports within the second quarantine district of the island of Cuba for the fiscal year ending June 30, 1899, and more especially of the operations of the United States Marine-Hospital Service from the time that said Service took charge of quarantine matters up to the date of this report, October 1, 1899.

The Marine-Hospital Service took charge of the quarantine of the port of Matanzas on the 13th of February, 1899, appointing Dr. Felix Garcia as temporary quarantine officer and relieving the former incumbent, Dr. Antonio Ferrer, who transferred to the former the office and the property it contained. The property turned over was practically valueless. The writer having been detailed as quarantine officer at the port of Matanzas, assumed charge of the office on March 9, 1899. The work of boarding and inspecting all the incoming vessels was commenced at once, as also the issuing of consular bills of health, with a previous inspection of the vessel, in case it were bound to a port of the United States.

The inspection of vessels was somewhat of a new departure, as up to the time that the Service assumed charge of quarantine matters it had been an almost general custom at this port, and probably throughout Cuba, for quarantine officers not to inspect except under special circumstances. There was absolutely no equipment for the work to be done, with the exception of the building formerly occupied by the captain of the port, and which was placed at the disposal of the Service by the collector of customs, to whose jurisdiction it belonged. The building was in a wretched condition, and it being evident that it would require extensive repairs to render it at all serviceable, and that this would entail considerable expense, the military authorities were requested to formally transfer the building to the Service. This request was cheerfully granted. The building is admirably situated for the needs of the Service, fronting the harbor and commanding a splendid view of almost the entire bay of Matanzas. The main city dock adjoins it on one side. It is a two-story frame building, rectangular in shape, of the plainest construction, and probably some 50 years old. It is bounded on the north and east by a breakwater of stone and cement, inclosing a small garden. On the south side it is bounded by the foot of the street from which the dock above mentioned projects; and on the west side by Pavia street. On account of the age of the building and its dilapidated condition, the repairs that have been made thereto have been directed simply to what was absolutely necessary for safety and a modicum of comfort. It was felt that if extensive repairs were projected or commenced, it would in the end involve, practically, the erection of a new building upon the old lines. It was, therefore, thought better to limit the repairs as above stated, with the expectation that within a year or two, if the present conditions continue, a new building might be planned and erected. On taking charge of the office, one of the first things that required attention was the construction of a disinfecting house to receive the apparatus which was to come. An excellent site was obtained on the main wharf, immediately back of the office building, and the work having been authorized by the bureau under date of March 28, the erection of the disinfecting house was begun at once. Some delay was occasioned through the bad faith of the first contractor who agreed to construct the building, but the work was finally finished on the 24th of April, and the disinfecting apparatus installed and ready for business on April 30. The disinfecting house is a rectangular frame building 36 feet 2 inches in length, by 16 feet 3 inches in width, covered with a tiled hip roof, and divided by a partition into two unequal parts, the larger part occupied by the disinfecting apparatus, and the smaller used as a coal deposit and as a storage room for disinfecting material.

The disinfecting plant consists of a steam boiler, a cylindrical steam disinfecting chamber, 8 by 4 feet, with a formalin-ammonia generator attached, 3 auto-claves, 33 sulphur pots, 1 force pump, with the necessary suction and discharge hose, an air-tight wooden box, constructed for the purpose of disinfecting small bundles with formaldehyde. The disinfecting plant, as will be noted from the above description, is a stationary one, and, although at the water's edge, the depth of the same is not sufficient to permit anything but lighters and small boats to come alongside, the mean depth being about 3 feet. The position of the plant, therefore, while excellent for the disinfection of outgoing baggage is not well-suited for the disinfection of vessels. For the latter purpose it is necessary to have the clothing, bedding, etc., brought from the vessel to the disinfecting plant by means of the ship's boats and returned in the same manner after disinfection. This method is open to objection, not only on account of the great delay and inconvenience caused thereby, but also because it is necessary for the crew of the vessel to have some communication, although limited, with the shore, while the disinfection of the vessel is under way. Of course the process is carried on under strict supervision and the danger thus minimized as much as possible. For the disinfection of the vessel itself it is also necessary to take aboard in boats the auto-

claves, bichloride pump, hose, sulphur, etc. The distance between the disinfecting station and the anchorage is about a mile, so it can be easily imagined how much delay and annoyance must result in carrying out the process of disinfection. The inconvenience is much increased by the fact that for the purposes above stated it is necessary to rely principally on the ship's boats. The necessity for some means of rapid transportation of personnel and material for the inspection and disinfection of vessels is apparent.

The efficiency of the plant, so far as the disinfection of vessels is concerned, would be greatly increased by placing it upon a suitable barge, making it a float-
ing instead of a stationary plant.

However, if the expense involved is not out of proportion to the advantage to be gained, I would suggest that the present plant be left unchanged and a new floating one be supplied. The two would be complementary to each other; the stationary plant to be used for the disinfection of outgoing baggage, and the floating one devoted solely to the disinfection of vessels and incoming baggage or freight. The service of disinfection would thus be complete.

No general disinfection is supposed to be done at any of the subports in this district, therefore they have not been supplied with disinfecting apparatus or material, with the exception of Cardenas, to which port a limited amount of material was issued. In case the necessity should arise at any of the subports for the immediate disinfection of a vessel, a preliminary and partial disinfection will be practiced with the means available (such as sulphur disinfection, sulphur being always easily obtainable), and the vessel then directed to proceed to Matanzas, or other convenient point, for complete disinfection. Inasmuch as all passenger traffic by sea from the subports bound for the North comes through Matanzas, all personal certificates of health are viséed here and all baggage disinfected or inspected and passed, as circumstances may require.

The personnel of the Service in the second quarantine district of Cuba is as follows: G. M. Guiteras, past assistant surgeon, U. S. M. H. S., in command of district; Felix Garcia, acting assistant surgeon, U. S. M. H. S., assistant and boarding officer; Richard Amieva, interpreter and clerk; Pablo Jorge, engineer; one fireman and two boatmen. Cardenas: Acting Assistant Surg. Enrique Saez, quarantine officer. Isabela de Sagua: Acting Assistant Surg. P. Garcia Riera, quarantine officer. Caibarien: Acting Assistant Surg. Barnardo Escobar, quarantine officer.

The work of the station may be best described under the two headings of "in quarantine" and "out quarantine," according as the measures taken refer to the introduction of quarantinable diseases into this city or district, or to the spread of quarantinable diseases from this city or district to other districts of the island of Cuba, to the United States, or Porto Rico.

For the purposes of the former the following measures have been taken, to wit, all vessels, foreign or coastwise, are inspected by a medical officer, and the quarantine regulations of the Service relative thereto strictly carried out. The inspection being made and the boarding medical officer satisfied that all is well, a certificate of discharge from quarantine is issued, which certificate is essential before the vessel can enter. In case a vessel should arrive with sickness aboard, an anchorage has been selected, sufficiently removed from other shipping, so that the vessel may undergo the necessary disinfection and detention without danger of spreading the infection. Arrangements have been made so that the sick can be promptly transferred to the lazaretto, and there isolated and cared for; and in case that the lazaretto for any reason should not be available, or that it be necessary to remove the crew of the vessel or the passengers, an isolated fort on the south shore of the bay, known as Peñas Altas, can be utilized for this purpose. In this connection I would state that if at any time it is deemed convenient or necessary to establish an "in quarantine" station for the protection of the port of Matanzas, the most convenient point is the site at present occupied by Morillo

Castle, situated at the mouth of the Canimar River, which opens on the south shore of the bay, and is about 4 miles distant from the city. At this point there is an excellent and deep anchorage close inshore, the only disadvantage being that it is somewhat exposed to the "northerly," but as these winds prevail only during the winter, when quarantine work amounts to little or nothing, it is evident that it is not a serious disadvantage.

The close proximity of the infected port of Habana to the ports comprised within this quarantine district, as well as their intimate communication by rail, over which this office had no control, made the work of inspection by sea rather unessential, but, nevertheless, it was deemed that some good would result from it, especially in view of the fact that the Army medical authorities had established a train inspection, directed particularly against suspected baggage from Habana. For the purpose of disinfecting the aforesaid baggage, the disinfecting plant of this station was offered to and accepted by the military sanitary authorities. From July 19 to September 30, 71 pieces of baggage coming from Habana were disinfected at this station.

The "out quarantine" measures taken may be described as follows: The steamship companies were directed not to issue tickets to any one unless they presented a health certificate signed by the quarantine officer, and it was generally advertised through the press that all persons intending to leave the island for the United States or Porto Rico should obtain a health certificate from this office, no matter whether they intended to take passage directly from this port or via some other port of the island of Cuba. In this way I am quite sure that no one has left this port directly, and very few indirectly, without having been first examined and supplied with the necessary certificate of health. The certificates issued are of two kinds, both certifying as to the present health of the individual, but differing in that one indicates that the person is protected against smallpox while the other, in addition to this, also certifies that he or she is immune to yellow fever. The certificates are printed on different colored paper (rose for the former and white for the latter), so that they may be easily recognized at a glance. All persons not protected from smallpox by a previous attack of the disease or by a recent successful vaccination were vaccinated prior to issuing the certificate. Subsequently, a short time before the vessel's departure the crew and passengers were inspected aboard and the passenger list compared with the certificates issued. All baggage leaving this port, either directly or via Habana, has been inspected, and if containing prohibited articles or bound to points south of the southern boundary of Maryland, or if it has been exposed to infection, it has been disinfected. All baggage thus inspected or disinfected has been labeled "inspected and passed," or "disinfected," as the case might be, and then sealed to prevent the possibility of reinfection in transit. For the disinfection of baggage the agent generally used is formaldehyde gas, applied by means of an autoclave. For the disinfection of large quantities of baggage, or for baggage that is presumably infected, steam is used.

The blank forms in use at this station are practically the same as those in use at Habana. Copies are herewith inclosed.

The general health and sanitary condition of the second quarantine district of the island of Cuba, during the period covered by this report, may be considered as excellent, and far better than the most sanguine expectations, considering the difficulties that had to be surmounted. I think that it can be justly said that, for the first time in its history, Cuba has had a proper hygienic and quarantine system, in accord with the advancements of science. The laws and regulations upon the subject of sanitation and quarantine during the old régime may have been excellent, but they were never strictly enforced.

But six cases of yellow fever were reported in the city of Matanzas, from January 1 to October 1, 1899, as shown in the following table:

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
Cases.....				1			1	2	2
Deaths.....				1				2	1

Of the above number, three gave a history of having originated in Habana. In two cases the diagnosis was open to doubt, and the remaining one alone showed unmistakable signs of yellow fever of local origin.

From the subports of Cardenas, Sagua, and Caibarien, not a single case of yellow fever or other quarantinable disease has been reported.

The almost total absence of yellow fever during the present summer is remarkable considering the large number of nonimmunes present on the island. While it is stated by some that the abnormal meteorological conditions of the present summer, with a very light rainfall, may have something to do with this excellent sanitary condition, there is no question but that much of the credit must be ascribed to the strict sanitary and quarantine measures that have been taken.

Below is appended a comparative statement of the number of deaths per month for the first nine months of the years 1898 and 1899, showing a remarkable diminution in the mortality, even though we take into account the special conditions existing in 1898. The table refers only to the city of Matanzas, but from approximate data it is evident that the improvement is quite as marked in the subports of this district.

Comparative monthly mortality in the city of Matanzas for the first nine months of 1898 and 1899.

Months.	1898.		1899.	
	Deaths.	Average deaths daily.	Deaths.	Average deaths daily.
January.....	722	24.90	323	10.41
February.....	554	19.78	256	9.14
March.....	385	12.41	205	6.61
April.....	302	10.06	138	4.60
May.....	317	10.22	127	4.09
June.....	316	10.53	118	3.93
July.....	378	12.19	118	3.80
August.....	508	16.38	112	3.61
September.....	712	23.73	102	3.40

The following table gives a résumé of the work performed at Matanzas during the period covered by this report:

	Fiscal year 1898-99.				July 1 to Sept. 30, 1899.	Grand total.
	July 1 to Dec. 31, 1898.	Jan. 1 to Feb. 12, 1899.	Feb. 13 (date when Marine-Hospital Service took charge) to June 30, 1899.	Total.		
Foreign vessels inspected on arrival.....	57	48	138	243	64	307
Coasting vessels inspected on arrival.....			13	13	153	166
Vessels disinfected.....			4	4	8	12
Bills of health issued to foreign vessels.....	53	34	105	197	63	260
Certificates of inspection to coasting vessels.....					132	¹ 132
Health certificates issued.....			199	199	218	417
Pieces of baggages disinfected.....			62	62	595	657
Pieces of baggages inspected and passed.....			134	134	181	315
Persons vaccinated.....			17	17	10	² 27

¹ The issuing of inspection certificates to coasting vessels commenced August 15, 1899.

² Approximately.

Besides the above a considerable amount of disinfecting work has been done at the request of the military authorities.

The intercourse of this office with the military government has been most cordial, and my thanks are especially due to the commanding general of this department, Gen. James H. Wilson, for his uniform courtesy and attention and for the appreciation which he has always shown for the work performed by this office.

Respectfully, yours,

G. M. GUITERAS,

Passed Assistant Surgeon, U. S. M. H. S., in Command.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORTS FROM QUARANTINE STATIONS AT NUEVITAS AND SUBPORTS.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Nuevitas, Cuba, November 1, 1899.

SIR: As directed in Bureau letter dated September 10, 1899, I have the honor to submit the following report of the operations of this station and its subports, the third quarantine division.

Quarantine work under the direction of the Marine-Hospital Service was begun on May 10, 1899, with the appointment of Dr. J. R. Ariza as temporary quarantine officer. At this time boarding and inspecting work only was done, there being no provision for disinfection or detention.

On June 5, 1899, Acting Asst. Surg. O. W. Stone, U. S. M. H. S., arrived at Nuevitas. Under his direction the erection of a disinfecting plant was begun on ground belonging to the city on the water front.

On August 12, 1899, Assistant Surgeon Richardson relieved Acting Assistant Surgeon Stone and assumed command of the service operations in this district. The disinfecting plant at Nuevitas is located on the water front, convenient to the wharves and ship agents' offices. It is a building 20 by 60 feet (constructed of rough boarding and not as weatherproof as it should be), divided into two rooms, the smaller used at present as an office and the larger, 20 by 40 feet, containing the disinfecting machinery, an upright boiler, and a Kinyoun-Francis steam chamber 8½ by 4½, with formalin apparatus attached. A formalin autoclave completes the disinfecting armamentarium.

A new office has been selected in a building very near to the plant and suitable in every way for the purpose, and it is the intention to occupy it upon the arrival of the necessary furniture from the States, requisition for which has been honored by the Bureau.

For boarding vessels a sailboat is used, hired by the trip, but a steam launch, the *Half Moon*, is now en route from New York to this port to be used for the purpose.

Since September 3 there has been maintained upon Cayo Puto, a small island about 4 miles from Nuevitas, a detention camp for nonimmunes traveling from infected points to Nuevitas and Puerto Principe. Two army hospital tents and the necessary camp paraphernalia were drawn from the Quartermaster's Department, United States Army, and placed upon the island and a sanitary guard placed in charge. Such persons as have been detained have been furnished with the regular army ration, uncooked, since they were all persons used to caring for themselves in camp. This camp has been of great use in permitting nonimmune travel from Habana to this place.

The personnel of this station and its subports is as follows:

Nuevitas: T. F. Richardson, assistant surgeon in command of district; J. R. Ariza, acting assistant surgeon, boarding officer; Juan Badia, engineer and disinfecter; Crescencio de Varona, sanitary guard; Eduardo Majariño, messenger. Puerto Padre: José M. Maceo, acting assistant surgeon, quarantine officer. Gibara:

Salvador Gomez, acting assistant surgeon. Mayari: Ciro Trancoso, acting assistant surgeon. Baracoa: O. W. Stone, acting assistant surgeon; Charles Cooper, sanitary guard.

The officers at the subports are instructed to report weekly to this office the sanitary condition of their ports and vicinity, the number of vessels arriving and departing, and all other matters of interest.

IN QUARANTINE.

All persons arriving at ports in this district from other Cuban ports are required to have a permit from a marine-hospital officer upon the inclosed (Exhibit A) or a similar blank, stating name, destination, date of issue, immunity, and usually the name of the vessel upon which the person arrives. In addition, the number of pieces of baggage, and whether disinfected, passed, or to be disinfected is stated upon the blank if necessary. All arriving vessels are boarded. Before permitting passengers, baggage, or cargo to be landed the boarding officer satisfies himself that all is as it should be, and that every passenger has his certificate, and that every piece of baggage has had or here received proper treatment.

At this port of Nuevitas all incoming baggage from Habana is disinfected—that to remain in Nuevitas by steam and that for Principe by formalin sprinkling. In addition to this, if the length of stay of the vessel permits, all baggage for the subports is here disinfected, but if this is not possible it is treated by formalin at its port of arrival and held for twenty-four hours.

No non-immune travel except under "military necessity" is permitted from Habana to any port in this district except Nuevitas, and then only with the understanding that the person is to complete five days from Habana on Cayo Puto. To date of this report no attempts to land without certificates have been detected. Vessels from infected ports are required to lie in open bay, holding only such communication with the shore as is absolutely necessary. In the case of one vessel, the regular weekly Habana packet *Humberto Rodriguez*, exception to this rule is made and the ship allowed to come to a wharf, which is rigidly quarantined during the entire stay of the boat (some thirty hours) in this port.

The inspection of immigrants, which may be classed with "in-quarantine," is done upon the arriving vessel, by the boarding officer, before they are landed or have been examined by customs inspectors.

OUT-QUARANTINE.

All steamship agents in Nuevitas have been instructed to issue no tickets unless the person who desires the ticket holds the required certificate or permit from this office; at this office no permit is issued unless the baggage of the person is at the same time submitted, and treated, and labeled properly. For passenger for New York special blanks are in use. (Exhibits C and B.)

Under the aforesaid condition it is reasonably certain that no one can leave Nuevitas unless he hold a certificate and his baggage be properly treated.

To all vessels, no matter to what port bound, bills of health are issued, and for this purpose two blank forms (Exhibits D and E) are in use in addition to United States consular bills of health; the one, Exhibit D, for vessels bound to all Cuban ports and the other for those to all other foreign ports.

Since August 16, 1899, 81 vessels have arrived and 81 bills of health have been issued. Previous to that date no record was kept, nor has any been kept of number of certificates issued, pieces of baggage disinfected, etc.

Three vessels have been fumigated—the steam lighter *Laura* on two occasions and the schooner *Anita* once.

Respectfully yours,

T. F. RICHARDSON,
Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORTS FROM QUARANTINE STATIONS AT SANTIAGO AND SUBPORTS.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Santiago de Cuba, November 1, 1899.

SIR: I have the honor to make the following report of the operations and equipment at this station and its subports, Manzanillo, Daiquiri, and Guantanamo, all comprising the fourth quarantine division of the island of Cuba (south coast, province of Santiago).

SANTIAGO.

This station had as its representative prior to the Hispano-American war Sanitary Inspector H. S. Caninero. At the beginning of hostilities he departed for Jamaica, returning after the surrender of the city and continuing his duties. The sanitary condition was then at its worst. The town was full of Spanish soldiers awaiting departure. Some 20,000 Cubans had returned to their homes without food or money, hungry and worn out with disease. The streets were filled with decaying animal and vegetable matter, the accumulated excrement of man and beast for weeks. No city was ever more inviting to disease, and few suffered more.

In three months—July, August, and September, 1898—there were 2,846 deaths recorded in the city, while several hundred bodies were burned without identification or record, 10 per cent or more of the population.

During three months great things were accomplished in improving the sanitary condition, but the ravages of intestinal diseases and paludism incident to the reconcentration continued to claim all classes, especially the old and young. In the next three months, which should have been the healthiest of the year, there were 1,113 deaths, a decrease of 58 per cent from the preceding trimester. Yellow fever prevailed among the Spanish troops at the time of surrender and continued with the Americans on up into the winter season. There was considerable doubt at the time as to the type of the disease, owing to its mild character, but it is generally admitted by all who were associated in treating the affection that it was the specific disease.

In January and February the health conditions improved. On February 19, 1899, P. A. Surg. M. J. Rosenau, and Clerk Schwan arrived and immediately commenced to arrange for a disinfecting station. The necessary disinfecting machinery had been sent previously. A barkentine was bought and equipped for use as a floating disinfecting plant. I arrived at this station May 3, 1899, relieving Passed Assistant Surgeon Rosenau, and completed the work begun by him.

DESCRIPTION OF GROUNDS, BUILDINGS, AND DISINFECTING APPARATUS.

Office.—The office is located at No. 8 San Basilio street, in the central part of the town. It is admirably adapted to the work. One of the rooms is set aside as a laboratory, which is well equipped.

Shore disinfecting plant.—I have recently erected a substantial frame building at the water's edge for the disinfection of personal baggage and mail in transit to other parts of the island, Porto Rico, and the United States. The dimensions of the building are as follows: Length, 48 feet; breadth, 28 feet; height to square, 14 feet, to gable, 18 feet. It has a cement floor and galvanized roof. On the water front is a wharf 12 by 28 feet, for the launch and for storing baggage after disinfection until it is placed on board ship. This plant is equipped with a 56-inch Kinyonn-Francis disinfecting apparatus, and is well adapted to the work intended.

Disinfecting bark Rough Rider.—The dimensions of this boat are as follows: Length, 112 feet; beam, 22 feet; deck space 90 by 19 feet; tonnage, 460. It is equipped with two 56-inch Kinyonn-Francis disinfecting chambers, two boilers, one Kinyonn-Francis sulphur furnace, Sturtevant exhaust fan, engine and con-

nections, and a bichloride pump. The chambers are located abaft abeam, leaving sufficient space on the after deck for infected material. The disinfected part is between the cylinders and boilers.

The boilers, bichloride pump, engine, and sulphur furnace are compactly located in the forward part of the boat, the pump and furnace each having three connections on the starboard side, forward, center, and aft. All machinery is protected with a roof and high gunwales; between the gunwales and roof are canvas curtains, which can be raised or lowered according to necessity.

Steam launch.—The steam launch *Branham* is used by the boarding officer in official work and as a tender to the *Rough Rider*. It is 38 feet long and fairly well adapted to the work.

OFFICERS AND EMPLOYEES.

The following is a list of officers and employees at the end of the fiscal year:

Santiago.—Asst. Surg. Herman B. Parker in command; Sanitary Inspector H. S. Caminero, boarding officer; Leonard Schwan, acting clerk. James Leach, engineer and machinist; Prince Allen, carpenter; Frank Ellis, captain Manuel Suarez, E. Jeffrey, Charles Campbell, laborers, on *Rough Rider*.

Manzanillo.—Sanitary Inspector R. de Socarras, boarding officer.

Guantanamo.—Sanitary Inspector Luis Espin, boarding officer.

Daquiri.—Sanitary Inspector Juan J. de Jongh, boarding officer.

Gibara.—Sanitary Inspector Salvador Gomez, boarding officer.

The following is a list of officers and employees at the present time:

Santiago.—Asst. Surg. Herman B. Parker in command; Acting Asst. Surg. Luis Espin, boarding officer; Acting Asst. Surg. John Frick, in charge of disinfection; Leonard Schwan, acting clerk. James Harlow, engineer; Francisco Serrano, pilot; Jose Campos, attendant, on steam launch *Branham*. A. C. Henriques, engineer; N. W. Neeld, carpenter; Frank Ellis, captain; Manuel Suarez, Charles Campbell, Antonio Concheiro, Jose Seoane, Alex. Rodriguez, laborers, on disinfecting plants.

Manzanillo.—Acting Asst. Surg. R. de Socarras, boarding officer.

Guantanamo.—Acting Asst. Surg. H. S. Caminero, boarding officer.

Daquiri.—Acting Asst. Surg. Juan J. de Jongh, boarding officer.

METHOD OF INSPECTING AND CERTIFYING PASSENGERS.

Until the appearance of yellow fever on June 16, 1899, passengers were inspected and certified only when going to the United States either direct or by way of Habana. Passengers were inspected at the office and certified to according to the examination, cross-examination when not known, and by visual inspection, and the result certified to. Three kinds of certificates were issued.

I. *Certificates of protection from smallpox.*

U. S. MARINE-HOSPITAL SERVICE.

CERTIFICATE OF PROTECTION FROM SMALLPOX.

SANTIAGO DE CUBA, ———, 1899.

This is to certify that ———, a native of ——— and a resident of ———, years old. ———, color, ———, sex, ———, has produced satisfactory evidence to me that ——— is protected from smallpox by a previous attack of the disease, or by ——— successful vaccination. ——— by being revaccinated, ——— or vaccinated. ——— and that ——— is in good health at the present time.

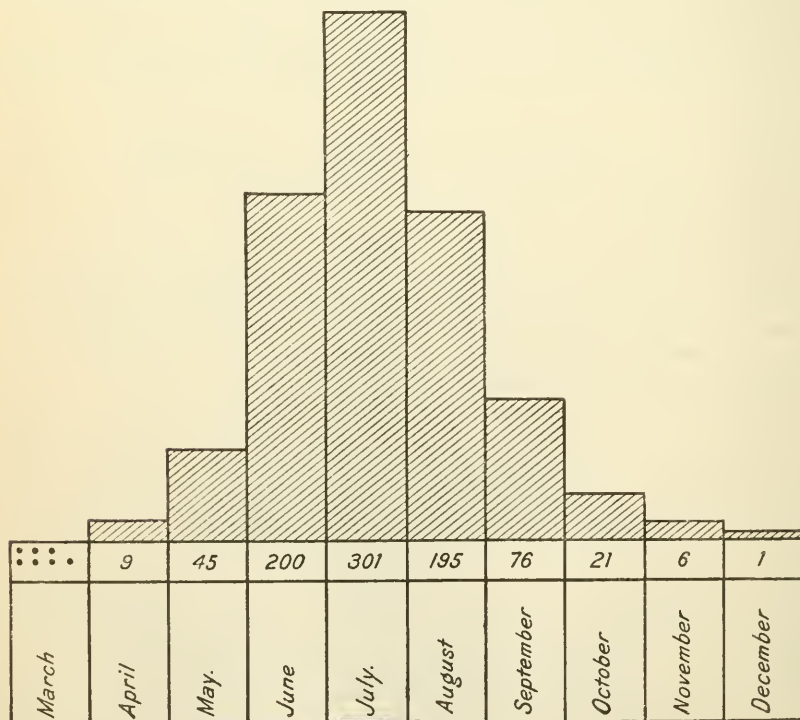
Personal description of the individual.—Height. ——— feet ——— inches. Weight, ——— pounds. Bald, partly bald, yes, no. Hair, straight, curly, black, gray, white,

red, blond, brown, mixed. Mustache, no, yes. white, gray, red, blond, brown, black. Chin beard, yes, no, white, gray, red, blond, brown, black. Side whiskers, yes, no, white, gray, red, blond, brown, black. Eyes, black, blue, gray, hazel, brown. Height, tall, large, medium, small. Form, full, medium, slender.

_____,
Assistant Surgeon, M. H. S.

These certificates were issued to passengers bound for the United States, Cuba, or Porto Rico, and were issued only after personal examination of the individual. The qualifications accepted were a good recent scar, evidence of smallpox, or a new vaccination. Owing to the smallpox epidemic of 1896 and its continued unreported prevalence, almost as many natives present evidence of smallpox as they do of vaccination. All applicants were revaccinated unless they presented evidences of recent vaccination. Since the opening of this office 715 persons have been vaccinated, of whom 325 were vaccinated prior to the close of the fiscal year. No special attempt has yet been made by the civil department to completely stamp out the disease by compulsory vaccination. In 1896 the town suffered from its severe epidemic, there being 859 deaths recorded, without doubt there were many more. Since then the type of the disease is on a parallel with that among the negroes in the Southern States, the eruption being, in many instances, limited to the face. The fatality is practically nil. It is worthy of note that I have vaccinated many men remaining here from the Southern regiments who in all their career were never vaccinated. They objected to being vaccinated, but, as transportation can not be issued without this certificate, they preferred vaccination to remaining here.

Inclosed find mortality curve of the epidemic of 1896.



Mortality curve of the smallpox epidemic in Santiago during the year 1896.

II.—*Health and acclimation certificate.*

HEALTH AND ACCLIMATION CERTIFICATE.

SANTIAGO, CUBA, ———, ———.

This is to certify that ———, a native of ———; residence, ———; color, ———; years of age, ———; sex, ———; has produced satisfactory proof to me that ——— has had or is acclimated to yellow fever by ——— residence in towns and cities where it has prevailed in recent years; that ——— is protected from smallpox by ——— successful vaccination, ——— revaccination, ——— or vaccination on this date, or a previous attack of the disease, and that ——— is in good health at the present time.

And I further declare my belief that ——— is ——— sufficiently acclimated to the diseases of the Tropics so that ——— presence ——— threatens no danger from yellow fever, cholera, or smallpox.

Personal description of the individual.—Height, ——— feet ——— inches; weight, ——— pounds. Bald, partly bald, yes no; hair, straight curly, black, gray, white, red, brown, mixed; mustache, yes no, white, gray, red, brown, black; chin beard, yes no, white, gray, red, brown, black; side whiskers, yes no, white, gray, red, brown, black; eyes, brown, black, blue, gray, hazel; height, tall, large, medium, small; form, full, medium, slender.

—————,
Assistant Surgeon, M. H. S.

These certificates certified to immunity to both smallpox and yellow fever. The same general rule applied to these as to the above. Positive evidence of immunity would be presented for both affections before issuing these certificates. These certificates were issued to the States direct and by the way of Habana.

III. *Immune card for Cuban ports.*

U. S. MARINE-HOSPITAL SERVICE.

IMMUNE CARD FOR CUBAN PORTS.

SANTIAGO DE CUBA, ———, ———, 1899.

M ——— is permitted to proceed to ———.

Immune.—Sex, ———; height, ———; eyes, ———; age, ———; form, ———; hair, ———; complexion, ———; distinguishing marks, ———.

Baggage, ———.

—————,
Assistant Surgeon, U. S. M. H. S.

This certificate was adopted at the appearance of yellow fever at this port, and was for the protection of Cuban ports. Owing to the large number of passengers for contiguous ports and the probability of acquired immunity in less than ten years' residence, the ten-year rule was not strictly enforced. This method was apparently satisfactory, as during the season not a single case was transported by water to any port in Cuba. From the beginning of July to the middle of September those not absolutely immune, or probably immune, were prevented embarking for ports this side of Batabano, on the south coast, and Habana, on the north coast. In order that ship, passengers, and ports of destination would be protected as much as possible, the following order was issued through military channels:

CIRCULAR No. 16.]

HEADQUARTERS DEPARTMENT OF SANTIAGO.

Santiago, Cuba, May 18, 1899.

The following is published for the information and guidance of all concerned.
By command of Brigadier-General Wood:

GEO. ANDREWS,
Assistant Adjutant-General.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Santiago de Cuba, May 17, 1899.

All passengers bound for any port in the United States will be required to have a "health and acclimation certificate" issued to them by the medical officer of the United States Marine-Hospital Service before securing transportation.

All baggage sent to the United States direct must first be inspected by the medical officer of the United States Marine-Hospital Service and passed or disinfected, in compliance with the quarantine regulations of the United States.

Baggage to be inspected or disinfected should be delivered on board the disinfecting barge *Rough Rider* (pier 1) at least twenty-four hours before the sailing of the steamer.

HERMAN B. PARKER,

Assistant Surgeon, M. H. S., in Command.

At the time of the appearance of yellow fever this order was applied to all ports over which the United States had control. On the 10th day of July, owing to the rapid spread of yellow fever and the infection of the U. S. army transport *McClellan*, I deemed it advisable to place all nonimmune passengers in quarantine after disinfection by steam of all their effects, including their personal clothing. For this purpose I secured the S. S. *Tomas Brooks*, keeping it in operation until the 23d day of August, when, the immediate necessity being over, I returned the ship to the owner and established a camp on Limeta Point, on the opposite side of the harbor, and about 3 miles from the city playa. This was kept in operation until September 13. In all 114 passengers were passed through this quarantine, and, so far as I am aware, with perfect safety to all ports to which the men were transported.

Transports at all times refused to receive passengers on board who had not passed through this detention, or those I would certify had not been exposed to infection. In some instances where soldiers came from noninfected inland posts I certified to their detention, believing that there was less risk in their immediate embarkation to the States than their ultimate infection around or near areas of infection.

The above work was carried out in a manner that shows that it was not anticipated. It met the wants for the time, but at a greater expense than should have been required had the difficulties been foreseen.

DISINFECTION OF VESSELS.

Treatment of infected vessels.—Five ships have arrived at this station with infection actually on board. The method of disinfection, briefly expressed, is as follows:

(1) The sick were at once removed to the hospital.

(2) The ship was remanded to the quarantine anchorage, and the *Rough Rider* immediately placed alongside; all movable articles were removed from the ship to the infected portion of the *Rough Rider*. This included all fabrics and articles with fabrics attached. These articles were disinfected by steam, or, if steam was inapplicable, with solution of bichloride 1:750. The crew was then brought down, disrobed, bathed, and their clothing disinfected. While this was being done sulphur was placed in the hold of the ship, the infected areas washed out with bichloride and then formaldehyde, using always twice as much formalin as is required by regulations. All the decks were then washed with bichloride. The crew and disinfected articles were then placed on board and placed in quarantine under observation for the required period.

DISINFECTION OF VESSELS PRESUMABLY INFECTED.

These were disinfected in the same manner, omitting the personal clothing of the men.

DISINFECTION OF WOODEN SHIPS PRESUMABLY INFECTED.

This was done strictly according to the regulations, or by sulphur twenty-four hours in hold, followed by bichloride 1:750 under pressure. Steaming of all fabrics and disinfection of stateroom by formalin was performed.

In all disinfections more reliance was placed upon steam and bichloride than the other disinfecting agents.

DISINFECTION OF BAGGAGE.

Two methods for the disinfection of baggage were used at this station—formaldehyde and steam.

(1) *Formaldehyde*.—This agent was used when circumstances were favorable, i. e., a tight box or trunk filled with personal articles of clothing. The method used was to remove contents of trunk and then replacing the articles, sprinkling gently with a small broom. In this manner formalin was applied to all articles and evenly distributed throughout the trunk.

(2) *Steam*.—This agent was used almost exclusively after the appearance of yellow fever for all articles leaving Santiago. It was specially applicable to Cuban baggage, that usually being in bundles. It was also used for all articles of bedding, as pillows and blankets. It is needless to remark that many articles were injured by this method, it requiring a good material to withstand a temperature of 235° F. for thirty minutes.

TREATMENT OF TRANSPORT BAGGAGE.

After the issuance of the order of July 11, 1899, all baggage placed on United States army transports was disinfected. Those having first and second class transportation were required to be ready for disinfection at a certain hour. They then brought their baggage on board the *Rough Rider*, deposited it in the cylinder, and then went on board a disinfected lighter alongside. Their baggage was delivered to them after disinfection. After the appearance of yellow fever all passengers were required to have their personal clothing disinfected prior to being placed on board. As far as I am aware, no articles were placed on board transports without prior disinfection.

TREATMENT OF DISINFECTED BAGGAGE TO PREVENT INFECTION.

Baggage in bundles, steamed, was given to passengers for use during the voyage. They only contained necessities for use during the voyage.

Baggage in trunks was sealed with the lead Service seals and instructions given not to break the seal until arrival at destination. This was followed strictly in United States army transports, but in merchant vessels, having nothing to fear at destination, we were not so particular.

All baggage disinfected was labeled as follows:

UNITED STATES MARINE-HOSPITAL SERVICE,

St. Jago de Cuba, — — —.

Disinfected and passed.

Not good unless officially stamped.

All baggage inspected and passed was labeled:

UNITED STATES MARINE-HOSPITAL SERVICE,

St. Jago de Cuba, — — —.

Inspected and passed.

Not good unless officially stamped.

"IN" QUARANTINE.

During the entire year a strict quarantine was maintained on vessels arriving at this port. All vessels except those carrying medical officers were subject to the

same inspection. This consisted of lining up the crew and passengers and giving them a visual inspection. Any person presenting evidences of fever were specially studied. The following regulations and instructions were adopted by Passed Assistant Surgeon Rosenau:

OFFICE OF MEDICAL OFFICER IN COMMAND M. H. S.,
Santiago de Cuba, February 21, 1899.

INSTRUCTIONS FOR PILOTS.

Pilots on boarding will instruct the following classes of vessels to fly a yellow flag (letter Q) at the fore, until free pratique be given by the quarantine officer.

Class I.—All vessels from foreign ports other than ports of the United States and Porto Rico. Vessels from foreign ports touching at ports of the United States, Porto Rico, or other Cuban ports will be considered as from the original port of departure.

Class II.—All vessels with sickness aboard.

Class III.—Vessels from or touching at infected ports, to be named from time to time by the quarantine officer, in the United States, Cuba, or Porto Rico.

At present all Cuban ports and Ponce, Porto Rico, are considered infected and vessels arriving here from them will fly the yellow flag and be inspected before entering.

M. J. ROSENAU,
Passed Assistant Surgeon, M. H. S., in Command.

CIRCULAR NO. 5.]

HEADQUARTERS DEPARTMENT OF SANTIAGO,
Santiago, Cuba, March 2, 1899.

The following quarantine regulations, prepared by the officer in command of the Marine-Hospital Service at Santiago de Cuba, are published for the information and guidance of all concerned:

OFFICE OF MEDICAL OFFICER IN COMMAND M. H. S.,
Santiago de Cuba, February 21, 1899.

QUARANTINE REGULATIONS.

1. Arriving vessels must fly the yellow flag (letter Q) at the fore, if belonging to one of the three classes, as per inclosed instructions to pilots.

2. Arriving vessels flying the yellow flag will be boarded and inspected at once by the quarantine officer.

3. The yellow flag must not be lowered until the vessel is granted discharge from quarantine.

4. Nobody or nothing is permitted to leave the vessel until she is granted discharge from quarantine.

5. No one but the pilot, custom-house officer, captain of the port, the quarantine officer, and his employees are permitted on board before the vessel is granted discharge from quarantine.

6. All vessels leaving port for ports in the United States or Porto Rico will be inspected by the quarantine officer at the time of departure. All persons on board will be mustered and inspected, and the sanitary conditions of the vessel examined, before the "bill of health" is issued.

M. J. ROSENAU,
Passed Assistant Surgeon, M. H. S., in Command.

By command of Major-General Wood:

JOHN H. BEACOM,
Lieutenant-Colonel, A. A. G., U. S. V., Adjutant General.

On August 7, 1899, the British steamship *Sutherland* arrived here with 1 case of yellow fever on board (the captain). He died the following day. This was

the only ship that had yellow fever on board on arrival, though the following ships developed fever within thirty-six hours after arrival: The Danish steamship *Flandria* on October 9 and the British steamship *Highfield* on October 25. All these ships were from Habana. The transport *Wright* had 1 case on board after arrival from Guantanamo on October 30. The origin of this case was Santiago, indirectly by infected material. All the cases were of a severe type. Indeed, I have never seen graver cases than these recover.

These ships were disinfected on the plan described above, and no greater recommendation can be said of the method than that the fever disappeared in every instance.

COOPERATION WITH THE ARMY.

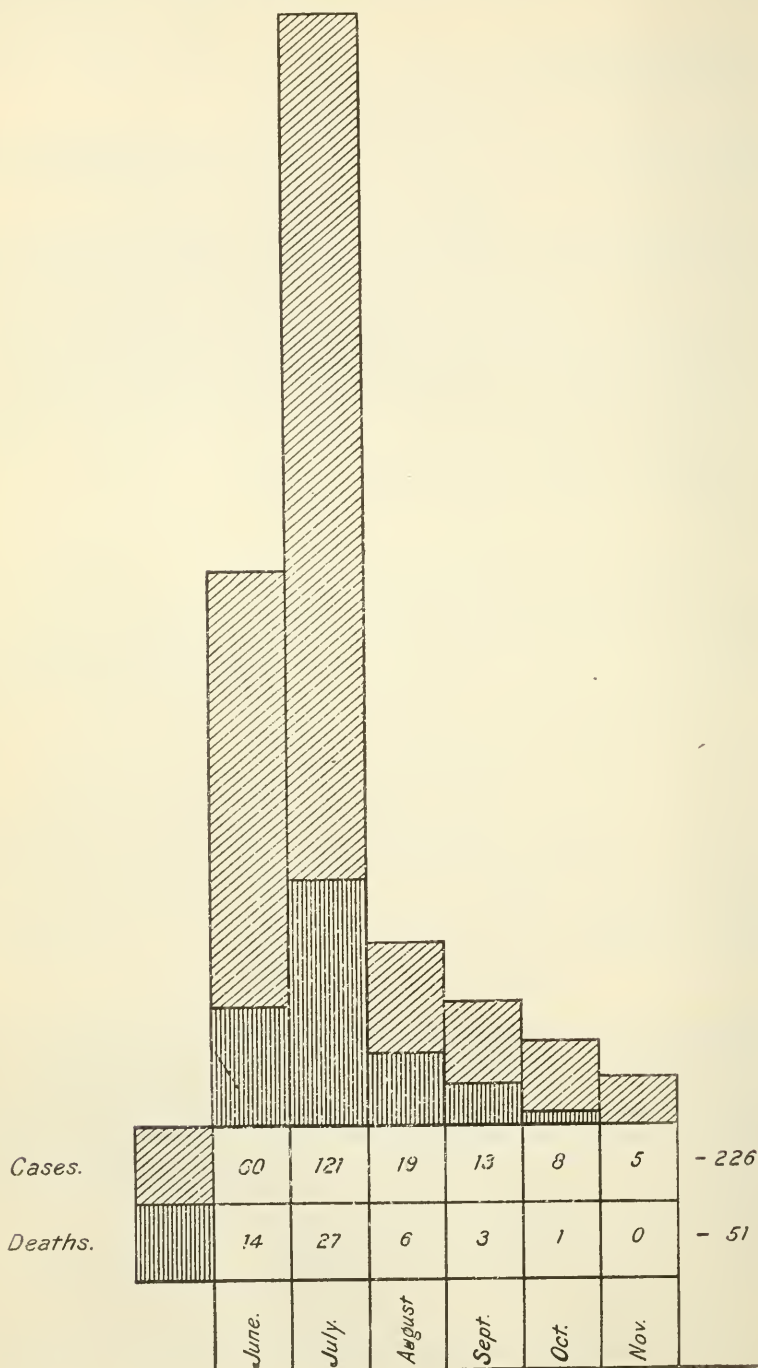
On June 17 four cases of yellow fever were removed from the military hospital to the lazaretto, the source of infection being the barracks occupied by 4 companies of the Fifth United States Infantry. These barracks were a notable point of infection during Spanish times, and from the virulence of infection maintained their previous record. A recommendation was made to remove the troops from these quarters, with their effects, and transfer them to camp some miles away from the city, after being disinfected on board the *Rough Rider*. This suggestion was in part acted upon on June 22; 2 companies were removed to a camp $1\frac{1}{2}$ miles away from the city after a more or less complete disinfection. In these 2 companies but 4 cases developed within the period of incubation of the disease. It was not deemed wise by the commanding officer to remove the other two companies, owing to the celebration of the various religious feasts at that time and the excitement that always attends these festivities. However, the fever increased, and on July 2 the remaining companies (120) were moved, after disinfection, to Boniato, a small village about 4 miles from the city. Within the period of incubation of the disease 20 cases developed, of which I believe 6 died. After five days the camp was removed and the disease practically disappeared. All the troops were then moved to Songo, and headquarters to Cristo, with practically complete disappearance of the fever. Many hundreds of pieces of baggage were disinfected on board the *Rough Rider* while this was taking place. After there were a number of convalescents in the hospital, it was deemed best to place these men under observation for a period of five days after disinfection. As a camp was not available, a suitable boat was obtained, and at the request of General Wood its conduct was supervised by myself. In all nearly 100 convalescents were cared for, extending over a period of one month. It is worthy of note that Morro Castle, which maintained a strict quarantine throughout the season, did not have a single case. The commander, Major Borden, and Dr. Mackee deserve credit for the intelligent regulations imposed and faithfully carried into effect.

COOPERATION WITH THE CIVIL AUTHORITIES.

There not being a regularly organized board of health or any plant for disinfection, offers of, and solicitations for, assistance were made at the same time. In all infected houses or houses from which yellow fever had been removed the inmates and their effects were sent down for disinfection, while the houses were disinfected by civil authorities. In this way also many hundred pieces of baggage were disinfected, of which no accurate record was kept. The hours of disinfection were from daylight until midnight, and, though greatly overworked, there were practically no complaints by the men employed by the service. Of all those employed but 1 was infected and died. He was of Spanish descent, and had only been employed four days before succumbing.

Inclosed you will find a diagram illustrating the yellow fever epidemic for the year 1899.

Yellow fever diagram showing relative proportion between the number of cases and deaths in Santiago, summer of 1899.



The following are the mortality statistics of the city of Santiago since January 1, 1888, to the present time. The first ten years of these statistics were made by my predecessor, P. A. Surg. M. J. Rosenau.

The shipping statistics since the opening of the office follow the mortality statistics.

Mortality statistics of the city of Santiago de Cuba during the twelve years 1888-1899.

Year and month.	Small-pox.		Tuberculosis.		Yellow fever.		Pernicious fever.		Fevers other than yellow and pernicious.		Other diseases.		Summary.		Total per month.
	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	
1888.															
January	1		16		2		3		4		42	2	68	9	77
February			11		1		4		1		47		64	7	71
March	1		9				8		6		52		75	6	81
April			13				1		4		52	3	70	5	75
May	2		5				8		10		64		92	3	94
June			13				27		12		54	1	105	4	109
July			17				14	1	11		64	2	106	25	131
August			13				13		2	4	69	1	97	13	115
September			9	1	1	23	9		4	1	58	2	81	27	108
October			7		2	28	9		6		64	4	88	32	120
November			9		2	10	6		6		56	3	79	12	91
December			14		1	22	6		12		59	1	92	23	115
Total	3	1	138	1	9	142	108	1	78	5	681	20	1,017	170	1,187
1889.															
January			14	2	1	16	3	1	8		67		93	19	112
February			13		2	8			4		44	4	70	12	82
March			17	1		1	3		3		49		72	2	74
April			15			3	3		8		65	2	91	5	96
May	1		6			3	16	1	13		69		105	4	109
June	5		13			2	18		7		60	1	103	3	106
July			9		3	12	6		19		65	1	102	13	115
August		1	14		1	23	6		7		53	2	81	26	107
September			7			21	11	1	4		47		69	22	91
October			8			18	2		7		60	1	77	19	96
November			10		4	5	5		2		45	1	66	6	72
December			10			8	9		4		65	1	88	9	97
Total	6	1	136	3	11	120	89	3	86		689	13	1,017	140	1,157
1890.															
January			10	1	2	1	3		6		48		69	2	71
February			11		1		1		2		60	1	75	1	76
March			6	1			2		2		66	1	76	2	78
April			11				3		2		54		70		70
May			13		1		6		3		62		85		85
June			8		1		9		2		57		77		77
July	1		11		2		7		8		45	1	76	1	77
August			7		1	6	4		4		51	1	87	7	94
September			10		3	3	9		3		61	1	86	4	90
October			8		3	10	4		3		86	2	104	12	116
November			11		1	9	6		5		47	1	70	10	80
December	1		15	1	5	2	4		4		62	1	91	4	95
Total	2		121	3	20	31	58		44		721	9	966	43	1,009
1891.															
January	1		17		6	1	1	1	10		77	2	112	4	116
February			21		2	8	3		4		57		87	8	95
March			23		3	3	5		3		70		104	3	107
April			9		3	3	2		9		62		85	3	88
May			9	1	4	21	3		20		80		116	22	138
June			14	1	4	25	8		35		85	1	146	27	173
July			8		1	22	11		22		112		154	22	176
August			8		1	7	4		16		65	2	94	9	103
September			17		1	2	4		6		68		96	2	98
October			12			1	2		11		62		87	1	88
November			13			1	6		5		77		101	1	102
December			15				7	1	8		58		89	1	90
Total	1		167	2	25	94	56	2	149		873	5	1,271	103	1,374

Mortality statistics of the city of Santiago de Cuba, etc.—Continued.

Year and month.	Small-pox.		Tubercu- losis.		Yellow fever.		Perni- cious fever.		Fevers other than yellow and pernicious.		Other diseases.		Sum- mary.		Total per month.
	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	
1892.															
January			6		1		7		6		69	1	89	1	90
February			11		1		11				65	1	88	1	89
March			10		1	1	7		4	1	35		57	2	59
April			16		1		5		3		83		108		108
May			5				2		7		82		96		96
June			14				18		4		69		105		105
July			11				12		7		65		95		95
August			7				7		6		77		97		97
September			14				5		8		65		92		92
October			11				10		2		65		88		88
November			14				6		4		67		91		91
December			7		1		6		2		73		89		89
Total			126		5	1	96		53	1	815	2	1,095	4	1,099
1893.															
January			14	1			3		6		71		94	1	95
February			8				1		1		61		71		71
March			12				6		4		101		123		123
April			13				4		4		106		127		127
May			10				11		3		72		96		96
June			9		1		10		3		89		111	1	112
July			10		2		10		7		84	2	111	4	115
August			16				3		14	3	92		125	3	128
September			6		1		3		8		49		66	1	67
October			15				2	1	7		57	2	82	3	85
November			9	1			2	1	7	1	62		80	3	83
December			12						10		62	1	84	1	85
Total			134	2		4	55	2	75	4	906	5	1,170	17	1,187
1894.															
January			14				8		7		63	2	92	2	94
February			13				2		3		46	1	64	1	65
March			15				2		3		66	1	86	1	87
April			10	1			4		2		51	1	67	2	69
May			7	1			5		4		54		70	1	71
June			9				2		5		59		75		75
July			12		4		8		7		81	2	112	2	114
August			9		6	1	4		17		61	2	97	3	100
September			9	1	8	4	4		5		45	1	71	6	77
October			10		5	11	5		2		58	1	80	12	92
November			7		8	1	5		4		58		82	1	83
December			14		3	4	4		9		66	1	99	5	104
Total			129	3	34	21	53		68		711	12	995	36	1,031
1895.															
January			12		1	1	5		6		83	2	107	3	110
February			12		1	2	7		8		52		80	2	82
March			14		2	4	3		2		61		82	4	86
April			20		2	11	14		4		103	3	143	14	157
May			19	1		7	18		12		111	5	160	13	173
June			20	2	10	49	28		28	2	165	5	251	58	309
July			14		24	174	27		42	4	151	5	258	183	441
August			19	2	10	118	38		45		160	6	272	126	398
September			15	2	8	80	15		57		156	2	251	84	335
October			29	1	7	51	19	2	40	1	108	9	203	64	267
November			13			48	12	1	29	2	123	5	177	56	233
December			25	1	3	18	11	1	22	2	131	5	192	27	219
Total			212	9	68	563	197	4	295	11	1,404	47	2,176	634	2,810
1896.															
January		1	19	1		11	9	1	18		136	6	182	20	202
February			24			23	9		24		138	2	195	25	220
March			17	1	1	5	7		32		49		106	8	114
April	9		27			7	7	1	21		145	3	209	11	220
May	45		23			9	16	1	35		140	4	259	14	273
June	200		14		3	15	20		38	1	173	2	248	18	266
July	301	2	22	1	1	62	27	1	34	1	179	5	264	72	336
August	195		28		5	93	16		41	1	143	3	228	97	325

Mortality statistics of the city of Santiago de Cuba, etc.—Continued.

Year and month.	Small-pox.		Tuberculosis.		Yellow fever.		Pernicious fever.		Fevers other than yellow and pernicious.		Other diseases.		Summary.		Total per month.
	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	
1896.															
September	76	1	36		3	34	26		49	2	175	1	365	38	403
October	21		37	1	1	37	13	1	54		184	4	310	43	353
November	6		25	1		29	12		59	5	184		286	39	325
December	1	1	36	3		24	7	1	33	9	154	6	231	44	275
Total	854	5	308	8	14	349	169	8	438	19	1,800	40	3,583	429	4,012
1897.															
January	2	1	39	2		9	9	3	23	2	236	3	309	20	329
February	1		37	1	1	1	5	1	16	1	205	2	255	6	261
March			32			2	16	1	35		254	3	327	6	333
April			32	1			14		20		234	1	300	2	302
May			34				12	1	24		364	3	434	8	442
June			33	3		5	18	8	40	2	385	9	476	79	555
July			29	3		85	28	10	63		304	27	424	132	556
August			24			68	14	5	34		240	16	312	93	405
September			31			60	12	2	35	3	188	15	266	80	346
October			40	1	1	24	12	1	27	1	180	4	260	31	291
November			45	2		7	17	4	40	1	172	10	274	24	298
December			40	1		6	44	2	46	4	220	16	350	29	379
Total	3	1	396	14	2	323	201	38	403	25	2,982	109	3,987	510	4,497

	Small-pox.		Tuberculosis.		Yellow fever.		Pernicious fever.		Fevers other than yellow and pernicious.		Other diseases.		Diagnosis unknown.		Summary.		Total per month.
	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	
1898.																	
January			65	14	14	70	16	44	11	295	120				481	135	516
February			36	12		47	13	32	13	255	120	1			371	128	399
March			48	12	11	19	13	12	13	248	135				330	144	374
April			32	13		20	13	10	13	184	119	2			244	118	262
May			37	11	15	17	15	11	14	177	111	1			233	121	254
June			37	11	12	17	15	7	15	154	120	3	12		218	135	253
July			25			26		10	11	270	11	95	21	426	13	431	
August			31	12	18	64	122	136	103	617	1155	385	181	1,233	18	1,552	
September			21			11		35		277		508	11	852	11	863	
October	1		31			24		46		296		106	12	504	12	516	
November			29			21		68		178		3	2	299	2	301	
December			22			50		47		171		6		296		296	
Total	1		400	115	120	386	142	458	1123	3,122	1,271	1,120	451	5,487	45	6,017	
1899.																	
January			23			29		45		117		1		215		215	
February			10			21		19		92		4		146	1	147	
March			17			16		18		74		2	1	127	1	128	
April			16			6		7		89		1	3	119	3	122	
May			18			5		9		63		2	2	97	4	101	
June			13	3	11	9		7		73		3	2	108	13	121	
July			14	9	18	12		7		51		5		98	18	116	
August			17	6		9		8		54		1	1	95	1	96	
September	23		9	3		4		12		44		3		78		78	
October			10		1	8		6		46		3		73	1	74	
November																	
December																	
Total	3		147		21	30	119	138		703		25	12	1,156	42	1,198	

¹ Spanish.² Leprosy.

From July 3 to July 17 the city was de-populated.

Mortuary statistics of the city of Santiago de Cuba, etc.—Continued.

SUMMARY.

Diseases.	1888.		1889.		1890.		1891.		1892.		1893.	
	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.
Smallpox.....	3	1	6	1	2		1					
Tuberculosis.....	138	1	136	3	121	3	167	2	126		134	2
Yellow fever.....	9	142	11	120	20	31	25	94	5	1		4
Pernicious fever.....	108	1	89	3	52		56	2	96		55	2
Fevers other than yellow and pernicious.....	78	5	86		44		149		53	1	75	4
Other diseases.....	681	20	689	13	721	9	873	5	815	2	906	5
Total.....	1,017	170	1,017	140	966	43	1,271	103	1,095	4	1,170	17

Diseases.	1894.		1895.		1896.		1897.		1898.		1899. ¹	
	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.	Civil.	Troops.
Leprosy.....											3	
Smallpox.....					854	5	3	1	1			
Tuberculosis.....	129	3	212	9	308	8	396	14	400	15	147	
Yellow fever.....	34	21	68	563	14	349	2	323		20	21	30
Pernicious fever.....	53		197	4	169	8	201	38	386	42	119	
Fevers other than yellow and pernicious.....	68		295	11	438	19	403	25	458	123	138	
Other diseases.....	711	12	1,404	47	1,800	40	2,982	109	3,122	271	703	
Diagnosis unknown.....									1,120	{ 45 214 }	25	12
Total.....	995	36	2,176	634	3,583	429	3,987	510	5,487	{ 45 2,485 }	1,156	42

¹ From January 1 to October 31.² Spanish.*Vessels inspected and bills of health issued.*

	Vessels inspected on arrival.	Bills of health issued.
February 25-28.....	4	1
March.....	83	28
April.....	66	37
May.....	91	37
June.....	71	35
Total.....	315	128
July.....	69	35
August.....	61	37
September.....	81	49
October.....	68	38
November 1-25.....	58	36
Total.....	337	195

Vessels disinfected.

- May 22. Norwegian steamship *Ella*, for Mobile, Ala.
 June 9. American schooner *John H. Tingle*, for Ship Island, Mississippi.
 June 12. Norwegian steamship *Ella*, for Key West, Fla.
 June 14. American schooner *Chas. M. Patterson*, for Savannah, Ga.
 June 20. American schooner *Daisy Farlin*, for Sabine Pass, Tex.
 July 8. Danish steamship *Flandria*, for Mobile, Ala.
 July 13. American schooner *Bertha Louise*, for Pascagoula, Miss.
 July 31. Norwegian steamship *Gyller*, for Mayaguez, P. R.
 August 3. Danish steamship *Flandria*, for Mobile, Ala.
 August 16. Prov. flag steamship *Maria Herrera*, for Ponce, P. R.
 August 17. British steamship *Sutherland* (infected), for Philadelphia, Pa.
 September 16. Prov. flag steamship *Maria Herrera*, for Ponce, P. R.
 October 12. Danish steamship *Flandria* (infected), for Guantanamo, Cuba.
 October 13. Prov. flag steamship *Maria Herrera*, for Ponce, P. R.
 October 14. Norwegian steamship *Parran*, for Ponce, P. R.
 October 20. Danish steamship *Flandria*, (redisinfected), for Mobile, Ala.
 October 30. British steamship *Highfield* (infected), for Philadelphia, Pa.
 November 1. U. S. Army transport *Wright* (infected).

GUANTANAMO.

Forty miles to the eastward of Santiago is the entrance to Guantanamo Bay. Caimanera, the port of Guantanamo, is located about 7 miles from the entrance. Guantanamo city, about 14 miles in the interior, is connected with Caimanera by railroad. In 1898, and for many years previous to that time, yellow fever had prevailed periodically in this city, being brought here usually from Santiago and foreign ports. In 1896 smallpox was epidemic, and many hundreds died of it. No accurate record is accessible at present, but if an opinion could be formed and expressed by observation I would say that fully 10 per cent of the present population are pockmarked, the remaining evidence of the existence of the epidemic. Since that time the immunity conferred by attack, association with, hereditary transmission, and vaccination has produced a mild form of the disease, which appears principally upon the face and parts where the skin is thin, and which exists practically all the time, though unreported.

Malaria, in all its forms, has here a natural habitat. Nowhere have I seen more marked evidences of malarial intoxication than here. The low-lying, marshy country; the presence of mosquitoes, the disseminators if not the actual carriers; the absence of an adequate water supply, and a bad personal hygiene are all predisposing factors for its dissemination and continuance.

Caimanera, the port, is without doubt the most unhealthy location for a village in all Cuba. Ordinarily there is but one nonimmune there, the deputy collector of the port. Obviously, yellow fever is scarcely to be considered. There have been two cases arrived during the present quarantine season, one on the British bark *St. Paul*, the other on the Danish steamship *Flandria*, in quarantine from Santiago. The *St. Paul* was disinfected then by my predecessor, P. A. Surg. M. J. Rosenau; the *Flandria* was returned to Santiago for re-infection.

The Service has been represented there in order by Dr. Nin. Dr. Espin, and Dr. Caminero, the latter being the present incumbent.

FACILITIES FOR DISINFECTION.

This port is so much a subport of Santiago that any special arrangement for disinfection would be superfluous. The rule established is to remove the sick to Cayo Peppin, one of the keys in the harbor, and clear the ship immediately to Santiago for disinfection.

The following are the statistics of Guantanamo for 1899:

	Vessels inspect- ed on ar- rival.	Bills of health issued.
April 15-30.....	10	2
May.....	28	10
June.....	26	14
Total.....	64	26
July.....	23	11
August.....	27	10
September.....	34	13
October.....	30	12
November.....	22	11
Total.....	136	57

MANZANILLO.

Manzanillo is a city of from 12,000 to 15,000 inhabitants, situated on the open sea, 65 miles north of Cape Cruz. The location of this city is one of the prettiest and most hygienic in the island, there being a gradual slope from the shore back into the hills, allowing an excellent natural drainage. The streets are wide and generally clean; the houses are typically Cuban. There are but few nonimmunes in the city at present, but the situation of the surrounding country will some day make it the most important city on the south coast of the island.

Yellow fever and smallpox prevail there periodically, but both could be suppressed completely as an endemic disease by proper sanitation. The past year 9 cases of yellow fever were reported, with 2 deaths, all among the military. The prompt removal of the troops to Bayamo prevented the further spread of the disease.

SHIPPING.

Three lines of steamships call there regularly, while many ships engaged in the sugar trade and coasting West India trade make frequent calls. It is estimated that during the coming winter nearly a million bags of sugar will be shipped, principally to the United States.

QUARANTINE.

The same regulations and instructions apply to this port as to Guantanamo and Santiago. There is no appliance there for the disinfection of baggage or ships. The instructions are to remand ships either to Santiago or Cienfuegos, depending upon the direction which they are going, for disinfection and detention.

Dr. R. de Socarras is at present the acting assistant surgeon on duty at that place.

The following are the statistics from the date of appointment of Dr. Socarras:

	Vessels inspect- ed on ar- rival.	Bills of health issued.
June 25-30.....	4	3
July.....	19	17
August.....	41	37
September.....	44	36
October.....	44	36
November 1-25.....	31	25
Total.....	183	154

DAIQUIRI.

This seacoast town is located about 15 miles to the eastward of Santiago. It is simply an "iron ore" village, the inhabitants of which are mostly Cubans. There is an iron pier to which vessels go to take on cargo.

The Service is represented there by Dr. Juan J. de Jongh. The doctor's services consist in inspection of the crews on entrance and departure, and the issuance of bills of health. In former Spanish times the amount of business transacted here was much greater than at the present time, owing to the better condition of the mines. Yellow fever was also more prevalent, because of the employment of recent emigrants from Spain. This year there has been but 1 case of yellow fever in the mines, that case coming from Santiago during the recent epidemic. The case was isolated and no more cases appeared.

The following are the statistics from the date of appointment of Dr. de Jongh:

	Vessels inspect- ed on arrival.	Bills of health issued.
April.....	6	4
May.....	3	4
June.....	6	5
Total.....	15	13
July.....	6	6
August.....	4	4
September.....	5	5
October.....	3	3
November 1 to 18.....	4	4
Total.....	22	22

Respectfully, yours,

HERMAN B. PARKER,
Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORTS FROM QUARANTINE STATIONS AT CIENFUEGOS AND SUBPORTS.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Cienfuegos, Cuba, November 1, 1899.

SIR: The operations of the United States Marine-Hospital Service at Cienfuegos and adjoining ports, under Executive order of January 17, 1899, were begun by Surg. H. R. Carter in February, 1899, who inspected the port, planned a disinfecting pier just inside the Government horseshoe-shaped pier, and appointed Dr. Luis Febles as temporary quarantine officer.

Under appointment of the Secretary of the Treasury as quarantine officer of the port of Cienfuegos, I arrived at my station on March 28, 1899, and took up the work outlined to me by Surgeon Carter. This consisted in preparing the station for any quarantine emergency that might arise, and at the same time carrying out the usual precautions in connection with incoming vessels, the sanitary regulation of the harbor and all craft in the harbor, the inspection and sanitary control of all vessels and their cargoes bound for United States ports or Porto Rico, and issuing bills of health to same.

The station was completed by the early part of May, and was equipped as follows: A disinfecting wharf, 36 by 20 feet, having water for vessels drawing 10 feet; a Geneste-Herschler steam chamber and boiler, the chamber being 7 feet 10

inches by 5 feet in diameter, moved from the old Spanish hospital at Santa Clara, and fitted with an exhaust jet capable of producing 17 inches vacuum. The equipment also included 29 sulphur pots, 2 challenge force pumps, 300 feet of hose for bichloride washing, and 3 Francis-Kinyon large-sized autoclaves for formaldehyde disinfection; also a full supply of disinfectants. A rowboat for boarding vessels in the bay was also obtained.

The inspection of in-coming vessels was from the beginning made only on vessels coming from foreign ports.

The situation of this city is peculiar, as it is connected by railroad—nine hours—with Habana. Considered from a quarantine point of view, this is the most dangerous port in this part of the world. The journey by sea from Habana occupies two days by the fastest steamers. At this time no other Cuban port had yellow fever in an active form, so that to restrict travel by sea from Habana, without restricting travel by railroad, would have been useless and unjust. The inspection of vessels requiring pratique was made in the bay according to the United States Treasury regulations, and the regular "Discharge from national quarantine" was required at the custom-house before the vessel entered. Later, as yellow fever became worse in Habana, and the sanitary condition of this port improved under the supervision of the United States Army, the inspection of vessels from Habana and Batabano (the port of Habana on the south) was begun, although it was evident that the wide open door for infection was the railroad, running daily, and over which no quarantine restrictions were imposed, and no effective measures were possible short of the prohibition of passenger travel.

The sanitary control of vessels in the harbor consisted in requiring all cases of illness or death to be reported to us, and in investigating any of a doubtful nature; also requiring vessels plying in the harbor to maintain a satisfactory condition, and the inspection of wharfs and cargo. The bay of Cienfuegos being large (about 14 miles by 6 miles), and having no wharfs declared infected, the above control has been easily exercised.

As no vessels leave Cienfuegos for Southern States under special regulations without disinfection or detention, the clearance of vessels leaving this port for ports in the United States is uniform and simple. Having been notified of the hour of proposed sailing, the vessel is boarded by the quarantine officer, who inspects all on board, examines the manifests, and makes such inspection of the vessel as he deems necessary. Any cargo of a doubtful nature is inspected before loading.

Owing to the fact that large vessels can not come into our disinfecting dock, and that most of the small steamers and sailing craft can not make their port in the prescribed five days, little outgoing disinfection has been done, as will be seen from the attached list of disinfected vessels; and this table also makes evident the need for a disinfecting barge for large steamers when we consider that every vessel disinfected at Cienfuegos for Southern ports would save at least four days' time.

Besides the issuing of bills of health to vessels for the United States, we have also been issuing pratique to all vessels leaving this port, at the request of the consuls of the various countries to which the vessels have been going.

The end of the fiscal year, June 30, 1899, found the health of Cienfuegos good, and the work of the station progressing smoothly, a systematic routine in perfect cooperation with the military and civil authorities. Then came the Santiago epidemic, bursting forth as it did with such fierceness as to unnerve nearly all the military authorities, who, in their anxiety to protect the lives in their keeping, importuned that the most prohibitive and excessive measures be put in force on the steamboat lines, which by their regular trips brought us so near to the dangerous infection. The report of yellow fever in epidemic form at Santiago was received here in the latter part of June, and immediately the regulations were extended to include all vessels coming from Habana, Santiago, and Manzanillo

and vessels from all Cuban ports carrying passengers. It was soon found necessary to require the latter class of vessels when from Santiago to anchor in the bay and not come to the wharf, being practically in quarantine, and this regulation was continued until the 1st of September. At the same time the disinfection of mail, and nondisinfected baggage from Santiago and Manzanillo was begun, the former by injecting formaline gas into the chamber up to a 20 per cent strength after a vacuum of at least 15 inches had been obtained; and the latter by live steam and formalin solution.

In the meantime the four smaller ports of Puerto Principe and Santa Clara provinces were evidently without protection and in danger, especially from the regular passenger lines coming direct from Santiago, in spite of the excellent outgoing precautions that were rapidly put into effect at that port. Having been directed by wire to exercise quarantine supervision over this district, immediate steps were taken to secure a reliable officer at each port and to put in force a system of certification which would allow only immunes or nonexposed persons to go from an infected to a noninfected port, especially if the latter was without a railroad, and at the same time to hinder as little as possible trade and travel between clean ports. As the regular boats touch at eight points, taking on and letting off passengers at each place, the problem presented some difficulties. Physicians resident at Casilda (Trinidad) and Santa Cruz were appointed quarantine officers of their ports and instructed. A physician resident at Cienfuegos was sent to Tanus (Sancti Spiritus) as quarantine officer, and a sanitary guard was sent to Jucaro. A complete certification plan was then put in force, and I quote the following with regard to these ports and the system from my report of August 10, 1899, made after personal inspection:

"*Jucaro*.—This is a town of between 100 and 200 persons, of whom 3 are Americans. It derives its only importance from being at the southern end of the Jucaro-Moron trocha and railroad (68 kilometers long), which crosses the island in almost a straight line. The principal city on this railroad is Ciego de Avila. As a port Jucaro is of small importance, its entire shipping consisting of the regular coasting passenger vessels, three a week, and coasting schooners, of which an average of two or three a month come from Santiago or Manzanillo, occasionally carrying passengers. No vessel from a foreign port has entered here since January 1. The port is naturally protected by its bad anchorage. The coasting steamers drawing 12 feet have to anchor over 3 miles from the shore. The representative of the Service here is a sanitary guard, who remains on board the regular boats while they are in port, and allows only those with proper certificates to land, and gives identification cards to those going on board. He also will require certificates from passengers coming on schooners from Santiago or Manzanillo.

"*Ciego de Avila* is a town of from 2,000 to 3,000 inhabitants, formerly of importance from being the headquarters of the trocha garrison. It now has one battalion of the Fifteenth United States Infantry in barracks, formerly a Spanish hospital, and although there was considerable yellow fever among the Spanish troops there, no case has appeared among the American troops.

"*Tanus de Zuza*.—This is a town of 400 or 500 inhabitants, and is the port of Sancti Spiritus, about 30 miles distant, with which it is connected by a railroad. The regular coastwise steamers, many coasting schooners, and some vessels from foreign ports touch here. Of the latter, 10 have entered this port since January 1, 7 of which were from Jamaica, mostly sailing craft; 1 from New York; 1 from England; and 1 on April 15 from Vera Cruz, six days out, with cattle. During the last nine years an average of 23 vessels per year from foreign ports have entered here, but many of these were from the United States, or touched first at other Cuban ports. Dr. Francisco Ravella is at present quarantine officer at this port, having been sent from here (Cienfuegos) to act in that capacity.

"*Sancti Spiritus*, one of the oldest settlements on the island, is a city of 11,000

inhabitants, and is situated some 30 miles from the southern coast, and has outside communication almost solely through Tunas de Zaza. The sanitary history of this place is bad, especially, during the revolution, when the city was crowded with Spanish soldiers. I am informed that shortly after the American occupation of this city several cases of yellow fever occurred among the troops, with 6 deaths. The disease was controlled, however, and no cases have occurred since this outbreak. There is at present one company of the Second United States Infantry (Captain Fremont) in barracks here. Their health is excellent.

“*Casilda*.—This is the port of Trinidad, 3 miles distant, affording it the only means of outside communication that it has. Trinidad is also a very old city, of some 12,000 inhabitants, having, however, a very good sanitary history. The health of the inhabitants and troops—one company Second United States Infantry—since January 1 has been excellent. One case, suspected to be of yellow fever, occurred in the town in the middle of July, but the patient has now recovered, disinfection has been done, and no other cases have developed. Dr. Alejandro Cantero is quarantine officer for the Service at this place, and makes all necessary inspections according to the special instructions for these ports. Since January 1, 18 vessels, besides coasters, have entered this port, all but 7, however, being from the United States.

“*Santa Cruz*.—This is an unimportant seaport on the southern coast of Puerto Principe province, connected by an almost impassable road, about 60 miles long, with the city of Puerto Principe. Dr. Juan Xiques is the quarantine officer of the Service here and is carrying out his instructions faithfully.

“It can be seen that all these ports are important, from a sanitary standpoint, only because the steamers direct from Santiago and Manzanillo touch there, and the general plan carried out, with the aid of Assistant Surgeon Parker at Santiago and his assistant at Manzanillo, is as follows: Only such passengers are allowed to embark at these places as can obtain either immunity certificates or certificates of nonexposure to infection; at the other ports, being noninfected, identification certificates are given to passengers going aboard west-bound boats, and a certificate is required of each one going ashore. In this way anyone going aboard without a certificate will be carried on to Batabano and kept on board there one day to make five days since the boat left Santiago. It is the intention to disinfect baggage of all Santiago passengers at Santiago and of American passengers at Manzanillo, and the officers at the ports where they land will see that such baggage is disinfected, and, if not, sending it on to this port for disinfection. Such baggage for Cienfuegos or Batabano can be disinfected here or at the ports of departure. At Santa Cruz and Cienfuegos all persons, including the crew, on these west-bound boats are inspected; at the intermediate ports only the passengers coming on board and those going off are seen. Apparently, this system is working satisfactorily, giving protection from Santiago to healthy ports, with little hindrance to travel. The steamship companies naturally assist in allowing on board only those having certificates, and they complain only of not being allowed to come to the wharf to discharge.”

It was the intention in the case of infection among the shipping of any of these lesser ports to send the vessel immediately to Cienfuegos and to arrange for the detention of suspects. Punta de Ladrillos, an isolated peninsula, situated directly across the bay, was utilized. This point is located 4 miles from the city and is entirely isolated. In order to have it ready for an emergency I took such steps as were absolutely necessary, namely, the construction of a small wharf for landing and the clearing of a part of the point. I also secured tents and tent floors, and made arrangements for cots, bedding, etc., and had an immune nurse engaged. I am glad to report that it has not been necessary to use this place.

In the latter part of August, owing to the increase of yellow fever at Habana,

and by direction of Surgeon Carter and Passed Assistant Surgeon Rosenau, a certification plan similar to that required for west-bound passengers was begun for those east bound going by the south coast. Only such passengers are allowed to go to these places as can be given (1) immune certificates, or (2) special permits on account of nonexposure, and the latter are only given when the applicant has been away from Habana at least four days. This system for passengers both east bound and west bound is still in force.

I have the honor to append herewith the following tables:

Mortality table, showing deaths from ordinary causes and from yellow fever.

Table showing the number of vessels, crews, and passengers inspected monthly.

Table showing the number of boats leaving these ports for southern points.

List of vessels disinfected at this port prior to departure.

Respectfully, yours,

S. B. GRUBBS,

Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

Vessels, crews, and passengers inspected.

Month.	Vessels inspect- ed.	Crews.	Passengers.	
			Entries.	Depar- tures.
March	9	166	76	55
April	25	540	64	126
May	24	662	74	70
June	23	627	73	63
July	50	1,214	1,176	32
August	61	788	1,492	298
September	60	920	1,606	664
October	63	794	1,929	574
Total	315	5,711	6,490	1,882

Vessels for Gulf coast ports.

Month.	New Orleans.	Galveston.	Pensacola.	Mobile.	Savannah and mis- cellaneous.
April	2	1	2	—	1
May	5	1	1	2	—
June	4	1	2	2	—
July	2	1	3	1	2
August	5	1	2	—	—
September	2	5	2	2	—
October	1	3	1	—	3
Total	21	13	13	7	6

Vessels disinfected at this station.

May.—Steamer *Miguel Jover*.

July.—Tug *Echo*.

September.—Tug *Somers N. Smith*, schooner *Ludwig*, steamship *Madrileno*, schooner *Iolanthe*.

October.—Schooner *Harry Stewart*.

Total: Two steamships, 2 tugs, 3 schooners.

Deaths from January to October, 1899, inclusive.

Month.	Total.	Civil hospital.	Deaths from tuberculosis.
January.....	405	111	33
February.....	219	67	33
March.....	177	59	31
April.....	160	48	18
May.....	169	47	12
June.....	116	32	13
July.....	150	47	13
August.....	125	40	7
September.....	100	35	14
October.....	113	35	14
Total.....	1,734	521	188

Deaths caused by yellow fever from January 1, 1894, to November, 1899.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1894.....	5	-----	1	1	1	1	19	14	8	3	1	1	55
1895.....	-----	1	-----	-----	-----	1	2	-----	7	8	10	5	34
1896.....	4	2	-----	1	-----	20	60	39	48	64	45	18	301
1897.....	3	-----	-----	1	1	3	40	41	17	5	2	2	115
1898.....	1	-----	-----	-----	-----	2	-----	1	-----	1	-----	2	7
1899.....	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1
Total.....	14	3	1	3	2	27	121	95	80	81	58	28	513

VESSELS EMPLOYED IN THE QUARANTINE SERVICE IN CUBA.

At the port of Habana, Cuba, the disinfecting barge *Protector* is now in service, having been temporarily transferred to that station March 2, 1899, she being originally built for service at Key West quarantine. This vessel is equipped with steam chambers, formaldehyde apparatus, a sulphur furnace, and all the necessary accessories of a complete quarantine plant. By means of this barge vessels are disinfected with great ease and dispatch, and she is employed also, in conjunction with the shore disinfecting plant, for the disinfection of effects of passengers leaving Habana for the United States.

The boarding of incoming and outgoing vessels at Habana is done by means of the steam launch *Waldo* and the naphtha launch *Gamma*. In addition to these the steamer *Fessenden*, 93 feet over all, is used in the harbor work at Habana and also for inspecting the various stations along the coast. This latter vessel is of yacht construction and is well equipped for the work mentioned. She was sent to Habana from the United States under her own steam.

At Santiago, Cuba, the hulk of a dismantled barge was purchased, rechristened the *Rough Rider*, remodeled, and equipped with a full outfit of disinfecting machinery similar to that on the barge *Protector*. The *Rough Rider* is in constant use during the quarantine season and has done good service. The launch *Branham* is used for boarding purposes at the port of Santiago.

A steamer was chartered at this port and anchored in the harbor for use as a detention camp for passengers before permitting them to embark on vessels bound for the United States. Later, a camp was constructed ashore and the detention steamer abandoned.

Negotiations are under way for the establishment of disinfecting barges at the ports of Cienfuegos, Matanzas, and Nuevitas, respectively, and boarding at these ports is done in steam launches purchased by the Service for the purpose, the *Urquhart* being stationed at Cienfuegos, the *McAdam* at Matanzas, and the *Prochazka* at Nuevitas. The latter vessel was sent to Cuba from the United States under her own steam.

List of the vessels employed in the quarantine service in Cuba.

HABANA, CUBA.

Disinfecting barge *Protector* (temporary): purchased December 22, 1897:

	Ft.	In.
Length	115	0
Beam	27	0
Depth	10	6
Draft	5	3
Price, \$19,500.		

Steam launch *Waldo*; purchased March 7, 1899:

Length	40	0
Beam	7	0
Draft (approximately)	2	6
Price, \$2,625.		

Steamer *Dora*, boarding vessel for inspection of all the island ports: purchased July 29, 1899:

Length	93	0
Beam	12	3
Draft	6	0
Net tonnage, 19.55 tons; price, \$15,000.		

Naphtha launch *Gamma* (to be returned to United States): purchased June 24, 1895:

Length	25	0
Beam	6	0
Draft (approximately)	2	0
Price, \$1,300.		

SANTIAGO, CUBA.

Steam launch *Branham*; purchased April 7, 1899:

Length	36	0
Beam	8	0
Price, \$3,395.		

Barge *Rough Rider*; purchased March 5, 1899:

Length	112	0
Beam	23	0

Tonnage, 460 tons: price, \$1,500; towing, \$300.

CIENFUEGOS, CUBA.

Steam launch *Cricket* (now the *Urquhart*); purchased August 25, 1899:

Length.....	43	4
Beam.....	8	3
Draft.....	3	0
Price, \$2,250; sheathing, \$295; extra boiler, \$575; preparing for shipment, \$45.		

MATANZAS, CUBA.

Steam launch *Mahogany Launch* (now the *McAdam*); purchased August 25, 1899:

Length.....	28	6
Beam.....	6	0
Draft.....	2	3
Price, \$1,800; sheathing, \$110; two hoods, \$100; preparing for shipment, \$36.		

NUEVITAS, CUBA.

Steam launch *Half Moon* (now the *Prochazka*); purchased September 26, 1899:

Length.....	70	0
Beam.....	10	6
Draft.....	4	6
Price, \$3,000; coppering, \$638.50.		

PORTO RICO.

Under date of July 30, 1898, the honorable Secretary of War requested that medical officers of the Marine-Hospital Service be detailed at various Cuban and Porto Rican ports. (See Annual Report, 1898, pages 693-694.) In accordance with this request Surg. A. H. Glennan was assigned to the port of San Juan, P. R., by the following order:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., December 9, 1898.

SIR: You are directed to proceed to San Juan, P. R., for duty as quarantine officer (incoming vessels) and port inspector (outgoing vessels). Health bills should be given to outgoing vessels, arranging therefor with the military authorities.

A request has been made on the Quartermaster-General to furnish you with transportation by the transport *Mississippi*, sailing from New York on or about the 14th instant. You will devote the intervening time to the study of the immigration inspection methods at New York.

Upon arrival at San Juan you will report in person to the commanding general, United States Army, showing him these instructions and also a copy of the letter of the Secretary of War, which is inclosed herewith for your information.

You will submit a report upon the situation at San Juan, both as to quarantine and marine-hospital relief, and as soon as possible make recommendations regarding the quarantine and marine-hospital relief at Ponce, and on other ports of the island both as to the necessity of quarantine and relief stations as opportunity may subsequently offer. This report should also include a statement as to the sanitary condition of the various ports and places inspected, and such recommendations as may be deemed necessary for additional professional service.

Until further advised, your status at San Juan will be that of special temporary duty, and your actual necessary expenses will be paid from the appropriation for "Preventing the spread of epidemic diseases."

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

Surg. A. H. GLENNAN,
U. S. Marine-Hospital Service, Washington, D. C.

Later, under the provisions of Executive order dated January 17, 1899, Surgeon Glennan was detailed as quarantine officer at the port of San Juan. Assistant Surgeon Lavinder was detailed as quarantine officer at the port of Ponce at the same time. Interesting special reports from these officers are published in the Public Health Reports, 1899. Following are the orders to Surgeon Glennan, similar ones being sent to Assistant Surgeon Lavinder:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., February 1, 1899.

SIR: I have to inclose herewith a copy of General Orders, No. 15, issued from the Headquarters of the Army, Adjutant-General's Office, dated January 20, 1899, which embrace an order signed by the President relating to quarantine in Cuba and Porto Rico. You are informed that Asst. Surg. C. H. Lavinder has been detailed in accordance with this order as quarantine officer for the port of Ponce, P. R. By direction of the Secretary of the Treasury you are hereby detailed as quarantine officer at the port of San Juan, P. R.

You are directed to confer with the military governor of the island, Gen. Guy V. Henry, with a view to securing his cooperation in the performance of your quarantine duties.

You will keep the Bureau fully advised, writing a letter, however brief, at least once a week.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

Surg. A. H. GLENNAN,
Marine-Hospital Service, San Juan, P. R.

Approved:

L. J. GAGE, *Secretary.*

REPORT FROM QUARANTINE STATION, SAN JUAN, P. R.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
San Juan, P. R., October 11, 1899.

SIR: In obedience to instructions contained in bureau letter, dated September 18, 1899, I have the honor to submit the following report of the operations of the Service in the island of Porto Rico for the fiscal year ended June 30, 1899.

In accordance with your instructions, dated Washington, December 8, 1898, I arrived at San Juan, P. R., on December 21, 1898, and reported in person to Gen. Guy V. Henry, governor-general of the island, for consultation in regard to the organization of the quarantine service of the island.

In November, 1898, the U. S. transport *Mississippi* (now named the *Buford*) arrived at San Juan from Cuba with a case of yellow fever on board. Some alarm was felt, and Major-General Brooke, then governor-general, cabled the War

Department, who referred the message to the Marine-Hospital Service Bureau for action.

The patient and passengers were transferred to the Cabras Island quarantine station and the vessel fumigated. At the quarantine station a single wall steam chamber was used to disinfect bedding and passengers' effects.

Upon arrival I found that the military authorities had appointed port physicians at the various ports of entry, who were paid by and under the control of the local military collectors of customs. These ports were San Juan and Arecibo, upon the north coast of the island, Fajardo and Humacao on the east, Ponce and Arroyo on the south, and Mayaguez and Aguadilla on the west; eight ports of entry in all. Vieques, upon an island of that name, was also a subport, but has been closed. Guanica, where General Miles first landed, has a good harbor but no shipping interests. Occasionally small vessels enter Porto Salinas (or Jobos), directly south from the Coamo baths.

I found that the subport inspectors were local physicians, non-English speaking Spaniards or Porto Ricans who held over, or had been reappointed, as already stated.

Although the records were generally kept in a careful manner, the inspections of vessels were made in a perfunctory manner, if at all, and in some cases by the boatmen who conveyed the ship's papers ashore for record. The only redeeming feature was, that as a general rule, vessels from foreign ports first entered at the large ports, San Juan or Ponce, and were inspected before proceeding to these smaller ports. The salaries of these subport inspectors were small, 20 to 30 pesos per month, equivalent to \$12 to \$18, United States currency, and they obtained fees from the vessels and agents, to the detriment of effective quarantine work.

All of the ports of the island, with the exception of San Juan are open bays, and vessels load and discharge by means of lighters. This has not been an unmixed evil, as dangerous vessels thereby had less free communication with the shore.

At this time, owing to the changes and interruptions caused by the war, maritime and municipal sanitary conditions were deplorable, and threatened grave danger upon the approach of warm weather.

For this reason General Henry constituted a military board of health for San Juan, which consisted of a line officer of the Army, as executive health officers of the city and port, two members of the city council, and the medical officer of the Marine-Hospital Service as advisor to the board, with the supervision of the port inspections. The main attention of this board was devoted to the cleaning up of the city of San Juan, which was accomplished in a most effective manner.

PORT INSPECTION.

Under date of January 13, 1899, I reported to you the objection to United States transports touching at San Juan and Ponce upon their return from Cuba to the United States instead of first coming to Porto Rico on the outward trip. This was not a military necessity and was a grave danger, because safe restrictive measures could not be exercised upon them in these harbors under the quarantine system then in force. Upon proper recommendations the route of the transports was changed, and with only three exceptions since that time, when the vessels were promptly quarantined, they have returned directly from Cuba to the United States.

The first steps taken were to enforce a few quarantine rules in the various harbors of the island, and to instruct the port physicians as to the proper method of boarding and inspecting vessels, the issue of bills of health, etc. This was accomplished from time to time by means of letters and circulars in Spanish and English and personal instruction.

The first form of instructions promulgated related to harbor rules, which was as follows:

U. S. MARINE-HOSPITAL SERVICE,
San Juan, P. R., February 9, 1899.

To Pilots, Masters, and Consignees of Vessels, and other persons concerned:

1. Pilots on boarding vessels to conduct them into the harbor, must proceed immediately to the pilot deck and remain there.

2. They should immediately direct the yellow flag to be hoisted as a signal for inspection, whether the vessel has sickness on board or not.

3. In case the vessel comes from an infected port, or has sickness on board, she should lay as near as possible to the quarantine station and blow the whistle three times as a signal for medical inspection at that place.

4. Pilots should instruct masters of the vessels in every case that under no circumstances should they let down steam or disconnect machinery until after inspection by the medical officer.

5. Pilots should remain in the vessel until permitted to go ashore by the health officer. No person should be allowed to come on board or leave the vessel before the inspection and decision of the inspecting officer.

6. Coastwise vessels having any sickness on board should display the yellow flag and not approach the wharf until permitted by the health officer.

A. H. GLENNAN,
Surgeon, Marine-Hospital Service.

JAS. A. BUCHANNAN,
Captain, Eleventh Infantry, Collector of Customs for Porto Rico.

The regular consular form of bills of health and supplementary blanks were issued to all the ports and substituted for local printed forms of the different customs districts. A printed blank weekly report was also required to be filled out and mailed to this office, which shows name of vessel, date of arrival, nationality, etc., also the dates of departure, number of bills of health issued, etc.

In addition to this a weekly mortality list of deaths occurring in the subport districts, with the nomenclature of diseases, is received at this office, and serves as a check list and indication of the sanitary condition of the district. In case the nomenclature of the disease is too general or obscure it is returned for verification.

This systematic organization of the quarantine service occupied some little time, but is now fairly satisfactory and effective.

Under date of January 23, 1899, I made a report to you upon the condition of the port of Ponce, the methods of inspection and treatment of vessels. This, the second commercial port of the island in importance, was undoubtedly in danger of having yellow fever introduced, and I cabled a recommendation that an officer of this service be assigned as quarantine officer.

In accordance with Executive order, Asst. Surg. C. H. Lavinder was detailed for this duty February 1, 1899.

EQUIPMENT OF STATIONS.

At the subports the boarding and inspection of vessels is effected in conjunction with the small boats of the customs service; the boatmen are employees of the custom-house, and the work is accomplished without expense to the quarantine service.

There is no present objection to this system, as nearly all the vessels from foreign ports are first inspected at San Juan or Ponce, and in any case of doubt or suspicion subport inspectors are instructed to hold the vessel in quarantine and telegraph this office for instructions. An infected vessel would be remanded to this station for detention and treatment. Thus far no such action has been required. One steamer arrived at Mayaguez from Santiago de Cuba, was held for instruc-

tions, and, having completed the period of observation after disinfection at the port of departure, was released.

SAN JUAN.

The equipment of this station for the boarding and inspection of vessels consisted of two yawl boats of 20 and 30 feet length respectively; the smaller one, however, although well anchored, was destroyed in the hurricane of August 8, 1899.

The boat is manned by a coxswain and 6 sailors in white uniform with "U. S. Quarantine" inscribed upon their caps.

Dr. Pedro del Valle, the assistant quarantine officer, was first appointed by General Brooke as port physician upon the assumption of military control. He is a native of the island, a graduate of the University of Michigan, and speaks English fluently. His services have been very valuable, not only in the quarantine work, but also as translator. The United States Quarantine Regulations were converted by him into Spanish in a very creditable manner, and they were printed in that language for distribution under authority from the Bureau.

Under the Spanish régime San Juan, like the other ports of the island, maintained an inspection of vessels in form only, and it can be clearly proven from the records that both smallpox and yellow fever were introduced through this port. There is nothing to show that troops and passengers were isolated, or baggage and vessels disinfected at any time, and it may be fairly stated that when smallpox and yellow fever did prevail they originated from vessels in the harbor.

It is true that in 1876 the authorities made an appropriation for the establishment of a quarantine detention station upon Cabras Island, a small island at the entrance to this harbor. It is inapproachable except for light-draft small boats, is a small wind-blown promontory, and never utilized to any extent.

A few years ago a small steam chamber of Parisian make and defective operation was purchased during the cholera scare, but never set in position until the fall of 1898. A full description of this island and buildings will be found in Public Health Reports, Volume XIV, No. 2, January 13, 1899.

Under the Executive orders of the President dated January 20 and March 13, 1899, placing the control of quarantine in the islands of Cuba and Porto Rico in charge of this Service, while a certain sum was set aside in the island of Cuba for quarantine defense, unfortunately a like specific allotment was not set aside for this work in Porto Rico. It has therefore been a difficult, and at times a disagreeable, task to maintain an efficient quarantine service for this island.

Early recommendations were made to the proper authorities for disinfecting barges, boarding launches, and other apparatus, but without success. It is to be hoped, however, that suitable equipments will be provided during the coming winter, and which are really needed and should be in operation all the year round in this tropical latitude. Under these circumstances, therefore, quarantine was organized upon the basis of a rigid inspection and exclusion service, which is described in the following headings, "In quarantine" and "Out quarantine."

IN QUARANTINE.

All vessels arriving from infected or suspected ports are detained at the quarantine anchorage. After careful inspection local immune passengers are permitted to land, and the nonimmunes are conveyed to the quarantine detention station for observation. All the local baggage is collected and taken ashore to the disinfection room, where it is inspected and sorted. Pieces labeled disinfected at the port of departure and having unbroken seals upon arrival are released; the remainder is disinfected with formaldehyde by means of autoclaves.

In some instances old soiled pillows, etc., are burned. These articles are prohibited entry, but will occasionally be found in the baggage.

Vessels en route from Cuba to Europe remain in Porto Rican ports (San Juan alone in almost every case) but a few hours and bring little, if any, freight from Cuba to this island. They are, therefore, allowed to transact their business "in quarantine" with a guard of immune quarantine attendants on board. They take coal, water, mail, sugar, and coffee in bags, by means of lighters, also, local passengers for Spain, whose friends are required to say their adieus and farewells without being permitted on board.

The establishment of this system required some firmness and watchfulness, but has been operated successfully this season. When first inaugurated the agents of the Spanish Trans-Atlantic Steamship Company manifested decided opposition, and even threatened to appeal to Washington. Upon their complaint to General Henry he gave me his unqualified support and stood ready to order a vessel out of San Juan harbor "incomunicado," but when I assured him that I could place local passengers in observation at the detention station before permitting them to land, and furnish the vessel coal and water in quarantine, this plan was adopted.

In past years this powerful line of steamers operated about as they pleased, without sanitary restraints of any kind, and were undoubtedly the carriers of infection; but now our relations are cordial and satisfactory, commercial traffic is not unnecessarily interfered with, and they recognize the wisdom of these precautions.

OUT QUARANTINE.

All vessels arriving from the United States and foreign noninfected or suspected ports are inspected, and histories of their immediate preceding voyages elicited, especially transports and steamers from the United States and Spain which touched Cuba on such voyages. Since the prevalence of the plague in Portugal, a rigid examination of Spanish vessels, passengers, cargo, and crew has been maintained.

Owing to the distrust and suspicion in past years of certain British and Danish West Indian authorities against Porto Rican ports, vessels touching here voluntarily transacted their business with limited communication ashore, in order to be allowed entry into St. Thomas and like ports. This was accomplished by the keeping up the quarantine flag after inspection and release, and loading by lighters. In some cases passengers from this island were refused, but since general vaccination has been practiced throughout Porto Rico and the institution of a reliable quarantine inspection service this distrust is fast disappearing.

PREVALENCE OF DISEASE.

On account of the free communication between Cuba and Porto Rico in past years yellow fever has prevailed to a greater or less extent yearly upon the seacoast of this island. Facts and figures are difficult to obtain, but in a table prepared by Colonel Hoff, chief surgeon, it is shown that the Spanish troops, with an average strength of 3,800 men from 1889 to 1897, had the following number of cases of yellow fever each year:

Cases.	Cases.
1889..... 114	1894..... 185
1890..... 169	1895..... 630
1891..... 24	1896..... 95
1892..... 99	1897..... No cases reported.
1893..... 91	

The rate of mortality is not given, but I am told by local physicians that it was between 35 and 45 per cent. During these same years the disease prevailed very slightly among the native Porto Ricans. It only attacked the new material—soldiers or citizens from Spain.

Acting upon these premises, in organizing the quarantine work of this island I have considered the adult Porto Rican living on the seacoast as an immune, not because of his residence in this parallel of latitude or yellow-fever zone, but because of his exposure to the disease for a number of years. There is only one immunity—that conferred by an attack of the disease, with a lessened susceptibility by a long residence in a tropical climate.

Not a case of yellow fever occurred upon the island this year, although the infection has approached its gates, and I am fairly convinced that it is not indigenous to this island. Where restrictive measures exclude the disease, the native immunity decreases in inverse ratio to the number of years since its last prevalence, and the native new born are attacked alike with the foreign population.

Smallpox.—During the winter and spring of 1898-99 this disease manifested an epidemic tendency, and, curiously, seemed to originate in the interior country districts, working down to the seacoast.

The Medical Department of the Army, recognizing the necessity for stamping out the disease, established a vaccine farm at Coano Springs, a short distance from Ponce, with a daily production of several thousand points. The island was divided into districts for vaccination, and the returns showed that in a few months over 800,000 persons were vaccinated.

This is probably the greatest work of this kind on record, uniting the production of the vaccine and its practical use upon the island. In many of the districts 86 per cent of the vaccinated reacted. The Medical Department of the Army deserves a compliment and commendation for this success in virtually stamping out the disease.

Leprosy.—As a member of the military board of health I have been interested in the collection and isolation of cases of this disease upon the island. It is estimated that there are about fifty of these unfortunates suffering with the tubercular form.

During the war a number who had been isolated in a frame building in the rear of the jail, near San Juan, became scattered, but were re-collected in this place. In a report to the authorities I recommended greater isolation and care for these public charges, and in coasting around for a suitable site offered use of Cabras Island Quarantine Station for this purpose, provided that Miraflores Island, a more appropriate place for a maritime detention station, would be ceded for this purpose.

The governor-general approved the exchange, and issued the following General Order:

GENERAL ORDERS, }
No. 137. }

HEADQUARTERS DEPARTMENT OF PORTO RICO,
San Juan, September 5, 1899.

The island of Miraflores and the public buildings thereon are assigned temporarily as the quarantine station of this port, and will be turned over to the quarantine inspector of the island of Porto Rico.

They will be put in order and so maintained by the board of public works.

By command of Brigadier-General Davis.

W. P. HALL, *Adjutant-General.*

A special report will be made upon leprosy and its isolation upon this island.

MIRAFLORES ISLAND DETENTION STATION.

This island is situated in about the same relative position to San Juan that the Reedy Island Quarantine Station is to Port Penn, Del. The ground, however, is high, about 15 feet above sea level, and comprises about 24 acres, two-thirds of which is upon the rise of ground. There is an almost inexhaustible spring of fresh water situated a short distance from the wharf.

The view from here is picturesque. The whole bay can be seen with its shipping, the city, perched upon its bold promontory, its stucco houses, colored in all the delicate tints of buff, blue, green, and pink, gleaming under a tropical sun, or seen dimly through the mist of a passing shower, on the one side; while on the other hand, opposite, rise the hills of Bayamon and the peaks of the mountain range back of them.

The buildings upon this island (Miraflores) are all of brick and mortar, in the massive style peculiar to Spanish masonry, constructed evidently to resist earthquakes and hurricanes. The largest building was built for a powder magazine, surrounded by a heavy wall of brick and cement. It is now being converted into a very good detention building by the board of public works.

In addition to the alterations and repairs to these brick and cement buildings, I requested that a frame building about 15 by 40 feet be erected at the base of the small cement wharf to house the steam chamber and to contain a baggage and formaldehyde-gas disinfecting room. This has been erected, and the wharf repaired where it had been destroyed by a powder explosion. The main building (150 feet long) has been partitioned off into seven large rooms as a detention barracks. The grading and cleaning of the grounds and pathways is being accomplished by a detail of prisoners and guards from the jail. Miraflores Island is so situated as to be valuable for marine-hospital or quarantine purposes, and its transfer to this Service should be confirmed by the coming Congressional legislation for Porto Rico.

I consider this exchange of islands a very valuable gain to the Service. It is four times the area of Cabras Island, lies much nearer to the channel, and has a running spring of fresh water which can be piped to all parts of the grounds. Additional quarters for the officers of the Service can be erected in the future and this be made an ideal station.

Cocoanut, and orange trees, and shrubs and plants will be set out this fall, and native plants of almost every shape and shade of form and color, that in the States the horticulturist laboriously cultivates.

STATISTICS.

The following figures are from January 1, 1899, to June 30, 1899:

Vessels inspected	257
Passengers inspected	12, 495
Passengers vaccinated	175
Crew inspected	14, 197
Pieces of baggage inspected and disinfected	151
Vaccination certificates inspected and viséd	1, 771
Vessels in observation quarantine	6
Vessels in absolute quarantine	4

From June 30, 1899, to October 1, 1899, as follows:

Vessels inspected	122
Persons inspected and vaccinated	205
Passengers inspected	4, 605
Pieces of baggage disinfected and inspected	72
Vessels in observation quarantine	7
Vessels in absolute quarantine	1

Respectfully, yours,

A. H. GLENNAN,

Surgeon, M. H. S., in Command.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT FROM QUARANTINE STATION, PONCE, P. R.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Ponce, P. R., October 10, 1899.

SIR: In obedience to instructions of Bureau letter of September 18, I have the honor to submit below a report on the work done at this station since I assumed charge on March 1, 1899.

Pursuant to your orders of January 31, I arrived at Ponce, P. R., on February 17, and after making a journey to San Juan, as directed, for instructions from Surg. A. H. Glennan, I returned to Ponce to assume charge as quarantine officer of the port on March 1.

On investigation I found the quarantine service under the charge of a local quarantine officer, who boarded and inspected all vessels arriving, and issued to each departing one a United States local bill of health. This system was established by the United States military authorities at the time of the American invasion and was conducted under their supervision. No disinfection of any kind was attempted, as there was no equipment for such work, and the quarantine officer had no offices whatever. He employed one man, a secretary, and used the custom-house boat for all boarding purposes.

As soon as I arrived I had an interview with the military collector of customs, who informed me that he could not then give me an office in the custom-house, but hoped to do so later, and in the meantime he offered me desk room in his own office. He also offered me the use of the custom-house launch in my work. I purchased a desk and chair and established myself temporarily in his office, and at once introduced, as far as possible, Marine-Hospital Service methods of boarding and inspecting vessels, and also began to issue United States bills of health, assuming this function conjointly with the United States consular agent of this port. The local quarantine officer was dismissed.

After several changes and much trouble, I finally obtained control of two large roomy offices in the custom-house, furnished them, and nominated an assistant to the Bureau. As there was no disinfecting equipment of any kind, I was forced to do the best I could with an autoclave and a supply of formalin which I had brought with me. All boarding was done in the custom-house launch.

The scarcity of funds has prevented any increase in my disinfecting equipment. The equipment consists of an autoclave and a supply of formalin; and in the disinfection of baggage, which is all that the station is capable of handling, I have had to use formalin, either by the sprinkling method or with the autoclave, and nearly always aboard ship. The port of Ponce is very crowded and there is no room on the water front for a disinfecting plant of any kind. I made many attempts to secure permission for the building of a small disinfecting room near the Government docks and finally was granted such permission, but the lack of funds prevented the building of even this. Finally, during July, under the orders of Governor-General Davis, such a room was built for my use by the Quartermaster's-Department of the Army, on piles near the Government docks, but before completion it was destroyed by the hurricane of August 8.

I have used and still use the custom-house boat (at first a naphtha launch, now a rowboat) for boarding purposes and the transaction of all business in the harbor.

The present personnel of this station consists of myself, an acting assistant surgeon, and one attendant (office boy and messenger). The port and city have been and are clean, with the exception of an outbreak of smallpox, which subsided soon after I assumed charge, and the work of the station has not been heavy. We have taken no precautions with outgoing passengers beyond inspection of baggage (for used bedding and similar articles, which are not allowed to go aboard); in addition to this, and for a short time only, vaccination certificates were required

for all outgoing passengers, and such certificates were furnished by this station when applied for. The passenger traffic of the port is not heavy.

I give below a summary of the work that has been done since I assumed charge:

March 1 to June 30, 1899:

Persons vaccinated	200
Vaccination certificates examined and stamped.....	500
Passengers inspected (incoming, outgoing, and in transit).....	422
Vessels inspected	114
Bills of health issued	146
Pieces of baggage disinfected	100
Immigrants inspected	261

June 30 to October 1, 1899:

Passengers inspected (as above)	409
Vessels inspected	70
Bills of health issued	73
Pieces of baggage disinfected	54
Immigrants inspected	199

Of course, with the present equipment no attempt has been made to disinfect vessels, partially or entirely. Vessels from suspected or infected ports have been held in quarantine to complete full five days from such ports, the baggage of all passengers for this port disinfected, and the vessel held in quarantine till departure. This has, of course, caused considerable annoyance to all parties concerned, but it was the best that could be done under the circumstances. Nearly all disinfection has been necessarily done aboard ship, as there was no place ashore where it could be done, the baggage afterwards being placed on deck under the care of a trustworthy man until brought ashore.

The conditions existent at this port require an expensive disinfecting plant, as I have reported, and this, with the scarcity of funds, has prevented the establishment of such a plant. Fortunately, up to the present the work of the station has not been heavy, most vessels arriving from clean ports, and a large part of the passenger traffic being conducted by such vessels. Where such has not been the case and disinfection was necessary, it has caused a great deal of trouble and been very unsatisfactory.

Respectfully submitted.

C. H. LAVINDER,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

MEXICO.

SANITARY INSPECTION SERVICE IN MEXICO.

The presence of yellow fever in Vera Cruz required unusual precautions, as shown by the following letter requesting the appointment of an acting assistant surgeon for the purpose of keeping the Bureau thoroughly informed:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., April 8, 1899.

SIR: I have the honor to request the appointment of Dr. S. H. Hodgson as acting assistant surgeon, United States Marine-Hospital Service, for duty on the coast of Mexico, with compensation at the rate of \$200 a month from this date.

This appointment is necessary by reason of information received of the existence

of yellow fever in Vera Cruz. One case of the disease coming from Vera Cruz has already been discovered on a vessel by quarantine officers in Porto Rico. In view of this and the additional fact that yellow fever has become almost endemic in Vera Cruz and very frequently epidemic in Tampico, it is considered imperative that the Service should have a medical officer on the spot.

Dr. Hodgson is immune, having had the disease in Central America, and has had some four years' experience in tropical countries.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General, M. H. S.

The SECRETARY OF THE TREASURY.

This detail was approved, and Dr. Hodgson arrived in Vera Cruz April 22, 1899. His instructions follow:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., April 8, 1899.

SIR: I inclose herewith your letter of appointment as temporary acting assistant surgeon of the Marine-Hospital Service for duty as inspector on the coast of Mexico, with compensation at the rate of \$200 per month from this date.

You are hereby directed to proceed without delay to Vera Cruz, Mexico, and as soon as possible make report to the Bureau with regard to the prevalence of yellow fever in that port. You will call upon the United States consul and show him these instructions and your letter of appointment, and request of him such aid as he may kindly give. Later, a request will be made of the State Department for an official letter of introduction to the consuls on the Mexican coast.

The Bureau wishes a letter on the sanitary condition of Vera Cruz and of the harbor, in addition to the information concerning yellow fever; and, after satisfying yourself as to the conditions in Vera Cruz, and supposing that there is no urgent necessity for your remaining to aid in preventing vessels from carrying contagious disease to the United States, you will proceed to Tampico, where you will follow the same general instructions. You will bear in mind in both cities the effect of railroad connection with the United States, and in your reports you will note what danger there may be of yellow fever reaching the United States through the Texas border from these cities.

As soon as practicable you will then proceed to Progreso; and, after having complied with the instructions as above given for that port and Merida, you will then either remain there or return to one of the other cities, choosing the one at which your presence is most necessary.

In the event of the presence of yellow fever at either of these ports you will cable the Bureau, using the word "lupus" for yellow fever, followed by the proper numerals to indicate the number of cases now existing.

On leaving a port, the day of leaving you should also cable the Bureau, using simply the name of the port to which you are going.

You will transmit a letter at least once in each week, or oftener if appropriate, giving a résumé of your actions for the week, bearing in mind that the Bureau desires to hear from you as often as possible, even though you write but a short letter. You will keep notes and be prepared also to transmit a full report upon the completion of your services for publication. Any items of interest relating to health conditions which may affect the United States should be included in your letters. "Lupulin" will be your code word signifying "suspected yellow fever."

Respectfully, yours,

WALTER WYMAN,
Surgeon-General, M. H. S.

Dr. S. H. HODGSON, *Washington, D. C.*

In accordance with Dr. Hodgson's instructions he transmitted an interesting report on the sanitary condition of the city of Vera Cruz, which was published in Public Health Reports of June 2, 1899, pages 833-836. The same volume contains other valuable reports from this officer.

On account of the yellow fever in Vera Cruz and other places in Mexico, measures appeared necessary to prevent its conveyance by rail into the United States over the Texas border. To this end the assistance of the State Department was requested in establishing a system of certificates, to be issued to passengers bound to the United States via the Texas border, showing recent residence in a noninfected locality, to obviate quarantine detention on the frontier.

Following is the correspondence with the Secretary of State:

JUNE 15, 1899.

SIR: I have the honor to invite your attention to the existence of an epidemic of yellow fever in the city of Vera Cruz, Mexico, and to the fact that this disease has already extended to the city of Cordoba, situated between Vera Cruz and the City of Mexico, and possibly to other places.

In view of the easy railway communication between Vera Cruz and the Texas border of the United States, it becomes necessary to take active measures to prevent the introduction of yellow fever into the United States by this route.

I have therefore to request that you will instruct the consul-general of the United States in the City of Mexico to notify the authorities of railways centering in that city that all passengers from Mexico to the United States must present at the border of the United States certificates from the consul-general or other reliable authority proving that they have not been for ten days in the city of Vera Cruz or other infected locality, and that all baggage originating in infected centers has been disinfected since leaving such localities.

It is further desired that consuls at all other railroad centers in the Republic of Mexico be instructed to issue, wherever the facts justify them, and they are requested to do so, certificates of the character stated.

It is desired that the parties required to furnish themselves with these certificates should be informed that these documents are to enable them to prove to the satisfaction of the quarantine officer on the Texas border their whereabouts during the ten days preceding their arrival there, and so expedite their passage of the frontier.

Respectfully, yours,

THE SECRETARY OF STATE.

L. J. GAGE, *Secretary*.

DEPARTMENT OF STATE,

Washington, June 20, 1899.

SIR: Referring to your letter of the 15th instant, asking that our consuls at railway centers in Mexico be directed to notify the railway authorities that all passengers from Mexico to the United States must present at the frontier consular certificates proving that they have not been for ten days in the city of Vera Cruz or other locality infected with yellow fever, and that all baggage coming from infected places has since been disinfected, I have the honor, by direction of the Secretary of State, to inform you that suitable instructions have to-day been sent to the consular officers referred to by you.

I have the honor to be, sir, your obedient servant,

THO. W. CRIDLER,
Third Assistant Secretary.

THE SECRETARY OF THE TREASURY.

DETAIL OF ASSISTANT SURGEON COFER TO THE CITY OF MEXICO.

In addition to the foregoing it seemed necessary to have a regular officer of the Service in the City of Mexico, and the following orders were addressed to Asst. Surg. Leland Cofer, whose report gives a clear idea of transactions until his recall, November 15. Acknowledgment is due the Mexican authorities for their courteous attitude toward these measures.

[Telegram.]

WASHINGTON, *June 16, 1899.*

Assistant Surgeon COFER,

Marine-Hospital Service, San Diego, Cal.:

Proceed without delay to El Paso, Tex.; await there instructions by mail. Detail of about three months. Duty, City of Mexico and other Mexican cities in connection with health service; travelers from Vera Cruz to United States. Wire arrival at El Paso. Make formal inspection at El Paso of Service work by Sanitary Inspector Alexander.

WYMAN.

U. S. MARINE-HOSPITAL SERVICE,

Washington, D. C., June 27, 1899.

SIR: Having arrived at El Paso pursuant to instructions contained in Bureau telegram of this date, you are hereby directed to proceed to the City of Mexico.

You will call upon and confer with the consul-general of the United States, who will be informed of the intention of the Bureau to detail an officer to aid in carrying out the precautions stated as necessary in the letter of the 15th instant, from the honorable Secretary of the Treasury to the honorable Secretary of State, a copy of which is herewith inclosed for your information.

You are directed to investigate the railway travel for the United States through the City of Mexico, and inform yourself thoroughly as to the usual routes of travel from Vera Cruz, Cordoba, and the cities on the line of railway west of Vera Cruz, to the United States. Having obtained the necessary information, you will endeavor to establish such a system of certification, as to recent whereabouts of passengers, as may enable the officers on the Mexican border of the United States to definitely determine whether a given passenger may or may not be a source of danger. At such places as it may be possible to secure reliable disinfection you will encourage the disinfection of baggage belonging to persons who have come from infected centers and are bound for the United States, exercising due care at all times to prevent the undertaking of such disinfection by parties not competent to perform the same, or whose certificate you would deem unreliable.

You will visit, as often as may be necessary, places outside of the City of Mexico on the line of railway between Mexico and Vera Cruz. You are instructed to make a careful inspection of the city of San Luis Potosi, with a view of ascertaining whether additional safeguards may not be established at that point, several cases of yellow fever having occurred in Tampico, and further cases there being altogether possible, if not probable.

On account of the exigencies of the situation, it is probable that it may be necessary for you to institute some measures without awaiting the assent of the Bureau, but you are instructed to keep the Bureau fully informed as to all your findings and procedures; and, in addition, to furnish to the officers of this Service, where such are stationed, and otherwise to the collectors of customs, or local health officers, on the Texas-Mexican frontier, all information which may aid them in excluding possible sources of infection.

Officers stationed on Texas-Mexican border: Acting Asst. Surg. Lea Hume, Eagle Pass, Tex.; Acting Asst. Surg. H. J. Hamilton, Laredo, Tex.; Sanitary Inspector E. Alexander, El Paso, Tex. Acting Asst. Surg. S. H. Hodgson is on duty at Vera Cruz, detailed by order of the President in the office of the consul. He is immune, well informed, and reliable. You should communicate with him. You are directed to make a formal written report of your transactions once each week.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General, U. S. M. H. S.

Asst. Surg. L. E. COFER,

U. S. Marine-Hospital Service, El Paso, Tex.

REPORT OF ASSISTANT SURGEON COFER ON MEASURES TO PREVENT INTRODUCTION OF YELLOW FEVER FROM MEXICO.

CITY OF MEXICO, MEXICO, Oct. 1, 1899.

SIR: In accordance with orders contained in Bureau letter of September 20, 1899, I have the honor to make the following report of the operations at this office of the Marine-Hospital Service and its suboffices in the Republic of Mexico, for the fiscal year ended June 30, 1899. Subsequent statistics of all operations to October 1, 1899, which are a part of and essential to this report, are therefore included in it.

As soon as possible after my arrival here on June 24, 1899, with Vice-Consul-General Hardy (Consul-General Barlow being out of town) I called upon the general officers respectively of all of the railroads centering in the City of Mexico. After stating to them the quarantine restrictions, which were ordered enforced by you at the Mexican-Texas frontier on account of the presence of yellow fever at certain points in the Republic of Mexico, I requested their cooperation in the matter of organizing a system of identification, inspection, and certification of passengers and disinfection of suspected baggage, which, it was claimed, would be of common benefit to the railroad and quarantine interests. After giving a brief outline of the proposed measures, which are described in full in this report, I was in every instance informed that while the railroad in question was being operated in Mexican territory and under Mexican laws, and while its managers must therefore disclaim any responsibility in the matter of quarantine laws enforced by the Marine-Hospital Service in the United States, they would willingly render all aid within their power, provided their expense did not include the purchase of disinfectants; expenditures which, for reasons given above, they could not make.

In answer to my telegram to you of June 26, 1899, in which the above conditions were set forth and the request was made for the authority to employ inspectors and purchase disinfectants, I received a telegram on June 28 upon the authority of which I made the following agreement with the railroad general officers.

First. That the Marine-Hospital Service would furnish inspectors and disinfectants.

Second. That railroad employees would be ordered to obey all orders relative to quarantine issued by an officer of the Marine-Hospital Service.

Third. That the railroads should provide proper disinfecting chambers at the cities of Mexico, San Luis Potosi, and Monterey, and furnish necessary help.

Fourth. That the railroads should provide uniform health certificate blanks and baggage labels, as prescribed by the medical officer in command.

Fifth. That the railroads would defer the sale of a ticket to the United States until the passenger's status was certified to, either by an officer of the Marine-Hospital Service or by a consular officer of the United States.

NOTE.—This precaution was suggested by this office and its enforcement con-

sented to by the railroads on the ground that they had the right to protect their cars and passengers from infectious disease. The Mexican Government, however, caused the railroads to discontinue this restriction on the ground that it was an interference with public rights. Fortunately, however, the protest was not made until fully one month after the inauguration of the rule, and it received so little publicity through the press that the traveling public is to this day in ignorance of it.

Sixth. That freight would be inspected, either by the medical officers in the Republic, or by those on the border, at the option of the railroads. All express matter subject to the same rule.

GENERAL PLAN OF IDENTIFICATION AND CERTIFICATION.

The objective points in these quarantine operations were Vera Cruz and Tampico. The first on account of an existing epidemic of yellow fever, and the second on account of its connection with Vera Cruz by steamer, its previous history, and the local conditions so constantly favorable to the spread of this disease. These, however, were by no means the only places quarantined against. The strategic points were the cities of Mexico, San Luis Potosi, and Monterey; the latter, after infection, to be replaced by Saltillo. The City of Mexico has daily connection with Vera Cruz by two lines of railway—the Interoceanic and the Mexican. San Luis Potosi and Monterey have daily connection with Tampico by the Mexican Central and the Monterey and Gulf lines, respectively. In these three cities Marine-Hospital Service officers were stationed, who enforced uniform quarantine restrictions prior to certification of passengers. On this account passengers had no reason to change their route on account of any possible differences in the quarantine rules at these cities, and the railroads have never complained of discrimination on the part of passengers from this cause.

It was required of every passenger from either the City of Mexico, San Luis Potosi, or Monterey, or from any locality south or east of these points, that Form A (vide Exhibit No. 1) should be attached to the railway ticket sold, and that the passenger, to avoid detention at the border, should report to the medical officer at either one of the above-named cities for certification or detention and disinfection of baggage, as the case might warrant. Passengers, on the other hand, from points north or west of the above-named cities, were required to have Form B (vide Exhibit No. 2) attached to their tickets, and were informed that detention and disinfection would be enforced at the border unless it could be clearly proven that no infected locality had been visited.

FORMS USED.

The forms were made after the model of a railroad ticket; and while each railroad made certain variations in the general appearance of the forms, the essential features remained the same in all.

CIRCULARS ISSUED BY THE RAILWAY COMPANIES.

The following circular was issued by the Mexican Central Railway, and one similar in character by the Mexican National:

[Mexican Central Railway Company, general passenger office. Circular letter. Quarantine restrictions.]

MEXICO CITY, July 6, 1899.

To Agents and Conductors:

The United States Government has established quarantine of 10 days at El Paso, Eagle Pass, and Laredo, Tex., gateways, on account of infected localities in the Republic of Mexico. These regulations require that hereafter every passenger holding a ticket from Mexico to any locality in the United States must have a cer-

tificate attached to said ticket, properly filled out by the selling agent, and when possible signed by the United States consul, vice-consul, or health-inspecting officer of the United States Marine-Hospital Service, stating that the passenger has not been for 10 days in the City of Vera Cruz or other locality infected with yellow fever and that all baggage coming from infected centers has since been disinfected.

Two forms of certificates have been provided for this purpose.

Form A is intended for use at the City of Mexico and San Luis Potosi, and must be attached to a ticket sold at either of the above points, or from territory east and south of these cities.

Form B is intended to be used in connection with a ticket sold from all points on main line and branches north of Mexico City and west of San Luis Potosi.

Agents at points north and west of Mexico City where there is no resident vice-consul should fill out blank as directed and instruct passenger to have it completed if possible by the jefe politico, judge, or other prominent citizen from point of departure, and in connection with the use of this form it would also be well to advise passengers that any documentary evidence which they are able to carry with them, going to show that they have not been in an infected district for 10 days will be of value, as it will facilitate the work of the quarantine officers at the border.

It should be understood that these quarantine regulations have been made by the United States authorities and that persons from the Republic of Mexico are obliged to comply with them to avoid detention at the Texas frontier. These certificates are furnished by this company at the suggestion of officers of the United States Marine-Hospital Service, and solely for the purpose of helping the passenger. The Mexican railway lines, which are all under the same restrictions, can make no guarantees that passengers will not be detained at the border if they are unable to clearly prove that they are not subject to quarantine regulations as outlined above.

Agents should give this matter as wide publicity as possible, by asking newspapers in their vicinity to give it notice, as a matter of interest to the public.

Conductors finding that passengers have not been provided with these certificates will follow directions shown in certificate as nearly as possible. Certificates above referred to must be securely pasted to tickets sold. No charge will be made for certificates or inspection of baggage.

A. HOFFMAN,
General Passenger Agent.
W. D. MURDOCK,
A. G. P. A.

PERSONNEL OF MARINE-HOSPITAL SERVICE IN MEXICO.

Mexico City.—Asst. Surg. L. E. Cofer (in command): Acting Asst. Surg. T. J. Turpin; interpreter and messenger, Robert Hardy.

Monterey.—Acting Asst. Surg. Walter H. Vilas (until September 7): Acting Asst. Surg. John M. Slobey (since September 7).

San Luis Potosi.—Acting Asst. Surg. Arthur H. Lloyd.

INSTRUCTIONS TO ACTING ASSISTANT SURGEON AT MONTEREY.

First. You will endeavor in every way to keep this office informed as to the health status of the city of Monterey.

Second. You will keep a list of the names of travelers from Vera Cruz to Tampico, which list will be furnished daily by United States Consul Magill, at Tampico, at the request of United States Vice-Consul-General Carrol of Monterey.

Third. You will transmit to the medical officers at the border daily lists of the hotel arrivals at Monterey.

Fourth. You will require ten days' detention and disinfection of baggage of all persons from Tampico and of all persons arriving on the Monterey and Gulf line, and

for the purpose of identifying these passengers you will meet regularly all north-bound trains on this road.

Fifth. You will regard with suspicion the statements and evidence of "traveling" men, and those persons who come from points north of Mexico City, and who claim ignorance of quarantine restrictions.

Sixth. If you have reason to suspect a case of yellow fever in Monterey, wire the facts to the Supervising Surgeon-General United States Marine-Hospital Service, the border inspectors, and the medical officer in command at the city of Mexico. You will then await orders to proceed to Saltillo, there to continue your work as before.

Seventh. You will issue certificates to passengers bound for the United States when you are absolutely certain that they have not been in a locality where yellow fever exists. When in doubt, disinfect their baggage and arrange their detention so that, if they so desire, they may travel in noninfectible territory, calling on consular officers of the United States for certificates to establish their presence in said noninfectible territory.

Eighth. Forward to this office, once a week, a report giving the number of passengers inspected, number of passengers passed with favorable status, number of passengers detained, with baggage disinfected, and number of passengers who have been refused certificates.

Ninth. Disinfect all baggage in the following manner: After removing the entire contents of the trunk or other container, arrange a single layer of clothes in the bottom of the trunk. Sprinkle these lightly but thoroughly with formol, using an ordinary whisk broom for the purpose. Then arrange another layer of clothes as before and sprinkle with formol in a similar manner, and so on until the trunk is filled. Close the lid and seal up keyhole and crevices either with adhesive plaster, putty, or wet paper. The trunk should then be placed in the air-tight chamber and retained there for forty-eight hours.

Tenth. You will label all baggage according to the status of the passenger owning it.

INSTRUCTIONS ISSUED TO THE ACTING ASSISTANT SURGEON AT SAN LUIS POTOSI.

The instructions issued to the medical officer at San Luis Potosi were similar to those of Monterey, with such changes as the different conditions at the former place would indicate.

GENERAL ADMINISTRATIVE DETAILS.

Passenger reports.—First. A report was received at the City of Mexico almost daily from Acting Assistant Surgeon Hodgson at Vera Cruz, which report contained the names of people entering and leaving that place. A copy of this report was forwarded immediately to each of the medical officers on the frontier, together with a daily hotel bulletin from the City of Mexico, until this latter publication became useless on account of the elimination from it of names of persons from infected places.

Second. The medical officers at Monterey and San Luis Potosi, respectively, forwarded daily lists of persons from Tampico to the inspectors at the border.

Third. Lists of all hotel arrivals in Cuernavaca were forwarded to the border for the purpose of identifying passengers who might have recently visited this popular resort and whose status was perfect.

Fourth. Assistant Surgeon Cofer visited, when necessary, a number of towns in the Republic for the purpose of securing information pertinent to or arranging the details in connection with the identification system ordered by the Surgeon-General.

Sixth. Letters and, when necessary, telegrams were being constantly exchanged with the border inspectors relative to the quarantine work.

Daily routine work at Mexico City.—First. Regular office hours were kept by the medical officer in the office of the consul-general, where the status of each passenger was decided on the evidence presented. The oath of the passenger was never required, but always the written indorsement of some responsible person whose name would be considered safe as a guaranty. When the passenger was unable to produce satisfactory evidence as to his right to a certificate, he was reported to the border and refused certification pending detention and disinfection of baggage. No doubt more than one passenger was needlessly detained, yet it was impossible to operate in the face of so many adverse influences without enforcing some arbitrary rules. When practicable the messenger was detailed to verify the statements of passengers, particularly women who were traveling alone, and every consideration consistent with efficiency was afforded them.

Daily visits to trains from infected localities.—Visits to incoming trains from infected localities were made daily for the purpose of "spotting" passengers and baggage. The good results of this were seen in a great many ways. It undoubtedly deterred a large number of passengers from trying to deceive us, as was evidenced by the frequency with which they would report themselves as coming from infected localities and ask for a statement as to the length of their detention, and make engagements for the disinfection of baggage.

Detention credit arranged.—After disinfection of baggage passengers were allowed to spend their period of detention in noninfectible Mexican towns, where there were stationed either Marine-Hospital Service or consular officers who indorsed on their certificates the date of arrival and departure for the information of the border inspectors. Not a few passengers, particularly traveling men or "drummers," took advantage of this privilege.

Tourists warned against visiting infected localities.—The majority of the tourists in Mexico very naturally include in their itinerary such places as Orizaba, Cordova, Jalapa, and Vera Cruz, and a large number of these people, on learning of the new quarantine restrictions, would call upon our officers for information. Our warning (after securing their names) against visiting these places under the penalty of detention and disinfection invariably deterred them from their original purpose. As nearly all of these tourists were from the States, and were probably not immunes, the good results which have been accomplished by the keeping of this fresh material from infected localities can not be overestimated.

Office hours in depots immediately prior to the departure of trains.—Medical officers of the Service were on duty at all depots for one hour prior to the departure of trains bound for the United States. Here passengers were certified and baggage was labeled. Disinfection of baggage was performed at this hour, as this was the usual time for receiving and delivering baggage at the depots.

Disinfection of baggage.—The disinfection of baggage was performed by means of formol. The sprinkling method was the one used, and the time of exposure was forty-eight hours.

Disinfecting chambers.—The railway companies used old freight cars for this purpose. A paper-packing lining was first applied, and this followed by a lining of flooring with leaded joints. When a broad or standard gauge freight car was used two partitions were placed on either side of the gangway, thus affording two separate compartments, with two sets of doors.

HARMONIOUS COOPERATION OF THE MARINE-HOSPITAL SERVICE OFFICERS STATIONED AT EL PASO, EAGLE PASS, AND LAREDO.

Sanitary Inspector E. Alexander, Acting Asst. Surg. Lea Hume, and Acting Asst. Surg. H. J. Hamilton rendered very valuable assistance by their letters and telegrams relative to persons and things involved in this quarantine work, and the prestige and effectiveness of the latter was greatly enhanced thereby.

Acting Asst. Surg. T. J. Turpin, M. H. S., was an able and valuable assistant on account of his previous quarantine experience in the service of the Texas State health department, as well as in that of the United States Marine-Hospital Service at Laredo, Tex.

Statement of the number of passengers inspected, passed, and detained and of the number of pieces of baggage inspected, passed, and disinfected at the cities of Mexico, Monterey, and San Luis Potosi, respectively, from July 3 to October 1, 1899.

PASSENGERS BOUND FOR THE UNITED STATES VIA THE MEXICO-TEXAS FRONTIER.

From—	Passengers.			Baggage.		
	Inspected.	Detained.	Passed.	Inspected.	Disinfected.	Passed.
City of Mexico.....	1,356	46	1,310	949	65	884
Monterey.....	607	12	595	518	16	502
San Luis Potosi.....	111	-----	111	42	-----	42

PASSENGERS BOUND FOR THE UNITED STATES AND CUBA VIA VERA CRUZ.

City of Mexico.....	53	-----	53	76	4	72
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Respectfully, yours,

L. E. COFER,
Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

CENTRAL AMERICAN FRUIT-PORT INSPECTION.

By reason of the active fruit traffic between the ports of Central America and Southern ports of the United States, and the danger of the introduction of yellow fever into the Southern States by this channel, it was considered necessary to detail acting assistant surgeons of the Marine-Hospital Service at these ports for the purpose of controlling the crews of the vessels while in port; investigating the sanitary condition of the ports, the vessels, and their cargoes; keeping the passengers under observation for a specified time before sailing, and disinfecting their baggage. With this end in view the following letter was addressed to the honorable Secretary of the Treasury:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., March 17, 1899.

SIR: I have the honor to request the appointment of the following-named physicians to be acting assistant surgeons for duty at the various fruit ports in Central America:

L. A. Wailes, Port Cortez, Honduras; William H. Carson, Port Limon, Costa Rica; H. B. Mohr, Bocas del Toro, United States of Colombia; William T. Hamilton, Ceiba, Honduras; N. K. Vance, Livingston, Guatemala; D. W. Goodman, Bluefields, Nicaragua; C. W. Knight, Belize, British Honduras.

Each of the above-named physicians to receive compensation at the rate of \$200 per month from the 21st instant.

The appointment of these physicians is necessary in order that the Bureau may be kept informed of the health conditions at the ports named, which are in constant communication with this country during the quarantine season.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General M. H. S.

THE SECRETARY OF THE TREASURY.

RULES FOR THE GOVERNMENT OF VESSELS WHILE AT FRUIT PORTS.

The acting assistant surgeons were assigned to their stations March 18, 1899. The following rules were promulgated March 20 for the government of vessels while at fruit ports:

1. None of the crew shall be allowed to go on land except the captain.
2. No one from the shore shall visit the boat except the quarantine officers, customs officers, and agent of the company which charts the ship.
3. All laborers who may be taken on the ship for loading purposes must have all their baggage disinfected before boarding the vessel and must have no intercourse with the shore subsequent to their entry upon the vessel until their final discharge therefrom.
4. No intercourse is to be allowed with persons on shore, except as provided in the preceding paragraphs.
5. No vessel in the harbor shall lie at any wharf, but must be anchored in the river or harbor in midstream, and lighters having been loaded by natives ashore may be unloaded onto the ship by the laborers who have been disinfected.
6. The ships, if going up a river or harbor for fruit, shall not be allowed to bring any passengers down the river on their return.
7. All passengers must embark from the regular ports and must have been under the observation of the sanitary inspector of the United States for at least ten days prior to the departure of the ship and be provided with his certificate to that effect. Immediately preceding their embarkation their baggage must be disinfected in accordance with the quarantine regulations of April 26, 1894, the most convenient methods being six hours' exposure to formaldehyd gas or twenty-four hours' exposure to sulphur dioxide gas in a closed chamber, the clothing being hung up on lines for the better penetration of the gas. Under no circumstances shall any passenger be allowed to carry bedding or household effects.
8. All outgoing vessels must be provided with a bill of health in accordance with the law and in addition thereto certificates in duplicate, signed by the medical officer attached to the consulate and giving the name of the ship, her master, the number of crew, and a list of passengers, their sanitary condition, and their ultimate destination in the United States, and stating the health conditions of the port and surrounding country, of the ship, and her crew, with any other pertinent information.
9. Finally, each medical officer detailed for service in a fruit port shall furnish a copy of each such certificate hereinbefore described to the Surgeon-General of the Marine-Hospital Service, sending the same by the ship which is being described. In addition to such copies of certificates a weekly report upon the condition of the port and surrounding country shall be forwarded to the Surgeon-General.

ACTING ASSISTANT SURGEONS DETAILED TO SERVE IN THE CONSULATES.

After the officers reported their arrival, they were detailed in the offices of the United States consuls under the provisions of the quarantine law of 1893, as explained in the following correspondence:

TREASURY DEPARTMENT,
Washington, April 15, 1899.

SIR: I inclose herewith a letter from the Surgeon-General of the Marine-Hospital Service requesting the detail by Presidential authority of acting assistant surgeons of the Marine-Hospital Service to serve in the offices of the consuls or consular agents of the United States in the several fruit ports of Central America to aid in carrying out the Treasury quarantine regulations as provided in section 2 of the act of Congress approved February 15, 1893.

I am informed by the Surgeon-General of the Marine-Hospital Service that in order to expedite trade between these ports and ports of the United States a strict surveillance over vessels leaving for the Southern ports of the United States is necessary, particularly with regard to the fruit vessels. With the regulations enforced at the port of departure, the fruit vessels may be admitted without detention at the port of arrival in the United States. Without such provision these vessels can not be admitted without detention, which ruins their cargoes.

Before transmitting the letter for the signature of the President I have to respectfully request an expression of your acquiescence.

Respectfully, yours,

O. L. SPAULDING,
Acting Secretary.

THE SECRETARY OF STATE.

DEPARTMENT OF STATE,
Washington, April 15, 1899.

SIR: By direction of the Secretary of State, I have the honor to acknowledge the receipt of your letter of this date inclosing a letter from the Surgeon-General Marine-Hospital Service in regard to the detail of acting assistant surgeons of the Marine-Hospital Service to serve in the offices of certain consuls and consular agents of the United States in Central American ports and asking the acquiescence of this Department before submitting the Surgeon-General's letter to the President for approval.

In reply I have to say that this Department sees no objection to the proposed action, and will be glad to give proper instructions to consuls in the matter after being advised that the detail has been approved by the President and being furnished with the names of the surgeons and the port to which each will be detailed. I return herewith the Surgeon-General's letter.

I have the honor to be, sir, your obedient servant,

THOS. W. CRIDLER,
Third Assistant Secretary.

THE SECRETARY OF THE TREASURY.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., April 15, 1899.

SIR: With a view to preventing the introduction of yellow fever into the United States during the coming summer and fall from the several fruit ports in Central America, acting assistant surgeons of the Marine-Hospital Service have been

appointed by yourself for service in said ports, to aid in carrying out the Treasury quarantine regulations.

I have now to respectfully request that these officers be detailed by the President to serve in the offices of the United States consuls or consular agents at the ports named, as provided in section 2 of the act of Congress approved February 15, 1893, and that the said officers be authorized to sign the bills of health conjointly with the consular agents at these ports.

The officers and their respective ports are enumerated as follows:

Dr. C. W. Knight, at Belize, British Honduras; Dr. N. K. Vance, at Livingston and Port Barrios, Guatemala; Dr. L. A. Wailes, at Puerto Cortez, Honduras; Dr. William T. Hamilton, at La Ceiba, Honduras; Dr. D. W. Goodman, at Bluefields, Nicaragua; Dr. W. H. Carson, at Port Limon, Costa Rica; Dr. Herman B. Mohr, at Bocas del Toro, United States of Colombia.

I have the honor to remain, respectfully, yours,

WALTER WYMAN,
Surgeon-General, M. H. S.

The SECRETARY OF THE TREASURY.

INSTRUCTIONS TO FRUIT PORT INSPECTORS.

Letters similar to the following were addressed to each of the fruit port inspectors, whose services were discontinued October 31, 1899:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., April 27, 1899.

SIR: By direction of the President you are hereby detailed, under the provisions of section 2 of the law approved February 15, 1893, to serve in the office of the consul of the United States at Belize, British Honduras, for the purpose of furnishing information, making inspections of vessels, supervising the disinfection of the same when necessary, and signing bills of health jointly with the United States consul at your port.

You will be guided in the performance of your duty under this detail by the quarantine regulations of April 26, 1894, a copy of which was forwarded to you with your original instructions at the time of your appointment.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General, M. H. S.

Acting Asst. Surg. C. W. KNIGHT.

U. S. Marine-Hospital Service, Belize, British Honduras.

REPORTS OF TRANSACTIONS AT FRUIT PORTS.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., September 18, 1899.

SIR: You are requested to transmit to the Bureau at once a report of the operations at your station for the fiscal year ended June 30, 1899, for publication in the Surgeon-General's annual report.

You will preface this report with a statement of the date upon which work was begun at your station, and the equipment for such work, including the grounds and buildings now occupied by you; a description of the disinfecting plant; also of any vessels which may be employed in performing the duties of the station.

You will state also the number of officers and other employees at your station, together with the duties of each.

You will describe the methods of inspecting and certifying passengers, including any special precautions which are applicable to your particular port. You will describe the methods of disinfecting vessels and baggage; also any special measures adopted to prevent reinfection of baggage en route to its destination. You will inclose copies of any blank forms in use by you which will be of interest in the report.

So far as possible, give statistics of the number of persons vaccinated; number of vessels inspected and the number disinfected; also number of pieces of baggage inspected and disinfected, and the total number of passengers inspected.

As to the statistical portion of your report, it is desired to have the statistics for the fiscal year ended June 30, 1899. Subsequent statistics to date of report should be added.

You will not confine the report necessarily to the suggestions above, but add anything which may be of interest.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General, M. H. S.

ACTING ASSISTANT SURGEON IN CHARGE,
U. S. Marine-Hospital Service, Port Limon, Costa Rica.

REPORT OF TRANSACTIONS AT PUERTO CORTEZ, HONDURAS—FRUIT PORT.

PUERTO CORTEZ, HONDURAS, CENTRAL AMERICA,
October 5, 1899.

SIR: Referring to your communication of 16th current, G, and in obedience to your request, I respectfully submit this report.

My appointment as acting assistant surgeon, bearing date March 21, with orders to report immediately for duty at this port, having been received, I sailed from New Orleans on the 23d, arriving at my destination on the 28th, reporting, as per instructions, to Consular Agent W. E. Alger, as medical attaché. I was courteously received and accorded a desk in the consular office, an unpretentious one-story frame building situated directly on the beach, near the custom-house, and also convenient to the wharf.

Having had the honor to represent the Louisiana State board of health at this port the preceding year, the fumigating and disinfecting plant was already established and equipped, as follows:

On the sea end of the wharf, and within 100 feet of the ships when at wharf, was erected under my supervision two apartments, joining but not communicating by any opening, 12 by 12 by 8 feet in dimensions. The walls, roof, and floor were built of dressed tongued-and-grooved plank running in reverse directions—having between them heavy tarred paper. The doors, the only openings except a small hatch on the roof, to be hereafter referred to, made precisely in the same manner—two thicknesses of plank, with the tarred paper between, and beveled so as to fit so closely as to entirely prevent the escape of the gas. The hatch referred to—about 12 by 18 inches—in the roof was made after the plan of the door and closed with a lever, a small hole just sufficiently large as to admit the nozzle of the hose from the gas generator being the only opening other than the door and hatch. I will state in passing that this apartment is so nearly air-tight that, when promptly closed after a fumigation, at the end of a week it has been found so thoroughly charged with the gas as to render it impossible to remain in it for even a minute.

The fumigation has been done by means of formaldehyde generators, having two very excellent machines, furnished by two rival fruit companies, who under the Louisiana regulations have been obliged to provide plant and bear all expense

connected with it. With some repairs these machines have done all the work of the season, so that I have not used the machine furnished by the Marine-Hospital Service, and which will be found entirely new and unused by my successor at this port.

The manual labor connected with the disinfecting operations has been performed by a very intelligent and efficient American negro, and he is the only employee I have had occasion for. I neglected to state that the apartments are furnished with lines crossing, upon which the clothing, etc., is hung during fumigation.

All baggage has been personally inspected, and all bedding, such as mattresses, pillows, blankets, quilts, or comforts, all heavy woolen wearing apparel, such as overcoats, ponchos, etc., and all upholstered articles of furniture, carpets, rugs, curtains, or portieres, etc., are rigidly excluded.

I have visited all vessels as soon after their arrival as possible. In some instances when they have anchored at a distance, in the absence of a boat, my visits have been delayed, but always before they communicate with the land. I ascertain the condition of health of crew and passengers, and if any are ill or not on duty I visit them in their cabins or bunks, or otherwise. If any require medical attention I prescribe for and attend them while in port.

After having prepared my report, certificates, etc., as well as provided passengers with health certificates and identification cards, in case of vessels going to New Orleans, I make a final visit to the vessel and certify her crew and passenger list the last thing before she leaves port.

I have not had any occasion to fumigate any vessels.

In case of the cattle ships from Cuba I have, in obedience to the rules imposed by the Marine-Hospital Service surgeon at Habana, inspected the holds and decks, and have found in every instance that the rule has been complied with and the holds and decks have been thoroughly washed and disinfected, at least so far as the liberal use of lime can do it.

Early in the season I reported that there was a rumor of smallpox at the capital—Tegucigalpa—100 miles in the interior, and I had been requested by the custom-house officials, under instructions from the Government, to procure for them a supply of vaccine, which I accordingly did, and, as an inducement and encouragement for the safety of the port, I offered to vaccinate free of charge the garrison and Government employees of the port. My offer was thankfully accepted, but the work has never been done. However, the threatened disease did not materialize.

Besides my efforts to have the port accept vaccination, in order to impress the necessity for precautionary measures of protection and sanitation. I proffered my services to the state in the capacity of port or quarantine physician without compensation, and for the past two months have boarded and inspected all craft visiting this port, other than the regular steamers plying to and from the United States.

There are numerous small vessels engaged in the coasting trade and the islands that are, in my opinion, a constant menace to the health of the Honduras coast. These are now, I am happy to report, under the strict regulations instituted by Señor Don Juan Peredes, the efficient and popular "Administrador del Aduana," ceaselessly watched and the danger reduced to a minimum: and I take occasion here to acknowledge the uniform courtesy of that gentleman, as, indeed, all other officials, and their kind attentions and assistance in the furtherance of the duties of my position.

I have inspected and certified, to June 1, 22 steamers, 3 sailing vessels; have examined and passed 167 passengers, and inspected and fumigated 214 packages, trunks, valises, etc., of personal baggage—to the present date 61 steamers, 7 sailing vessels, 327 passengers, and 393 packages of baggage.

In a former report I alluded briefly to the Honduras laws relating to health, sanitation, vital statistics, etc., and inclosed a copy of the code in pamphlet form. Since that report I have been at some pains to investigate the manner and extent to which those laws are enforced, and by the courtesy of the alcalde have had the privilege of examining the vital statistics record.

In this "comarca" or municipal district, including some ten or twelve pueblos and surrounding country, aggregating, by estimate, some 7,000 population, I found some two to five deaths and about as many births per month reported. It is made the duty of the attending physician or midwife or the head of the family or the police to report: but, although a penalty is imposed for noncompliance, no means are exercised to enforce the law. If the death or birth, as may be, comes to the knowledge of the official in charge of the records, he makes the entry, if convenient, so that the records, such as they are, are utterly valueless.

My inquiries as to the past medical history of epidemic diseases has been attended with no better results. A vague tradition exists of a severe epidemic of Asiatic cholera in Omoa some time in the "forties," or perhaps earlier. An epidemic of yellow fever prevailed here, it is said, some time in the decade between 1860 and 1870, introduced from Belize. In 1892 a severe and disastrous epidemic of yellow fever prevailed here and at San Pedro, 40 miles in the interior, at the then terminus of the Honduras Railroad. This was directly and clearly traced to Belize, having been introduced by a vessel with a cargo of coffee from Brazil.

It was in the following year, 1893, that tropical experience began, and a few remarks on the conditions existing at the time and the subsequent treatment may not be out of place, as they furnish a strong argument in favor of the efficacy of sanitation even in a tropical clime.

I was assigned to duty as its medical representative at this place, by the Louisiana State board of health, with the warning that I might expect to have to cope with an epidemic of yellow fever, as the conditions existing in Livingston, Guatemala, as well as in this port, were in every way favorable to the fostering and propagation of the infection.

Some two months before my arrival the Honduras Railroad, then actively pushing its construction, having already suffered materially from the epidemic, and realizing the disastrous results to be expected from a similar invasion, engaged the services of Dr. J. E. Austen, a gentleman who had enjoyed an extensive experience in the Tropics and in the management of yellow fever, in his connection with the railroad in Costa Rica; a man of rare ability and indomitable will, who, with the support, moral and financial, of the railroad management as well as of the Honduras Government, instituted in this port and in San Pedro a course of cleansing, disinfecting, and fumigating, radical in its scope, in which even the torch was called into requisition in cases of the dirty, unsanitary native houses in which cases or deaths had occurred; houses of a better class were subjected to a thorough treatment, the walls were denuded, the roofs, when of palm leaves, destroyed, drenched with carbolic acid and bichlorid solution, fumigated, and finally lime washed. I was an interested witness to these operations, and, knowing the conditions previously existing, the result, viz, seven years of absolute immunity from disease, in the heart of the Tropics, with a temperature seldom below 70° F., conditions eminently favorable to the keeping alive of the germs of disease, certainly furnishes a valuable lesson in sanitation.

Under permission to add "such other matters as may be of interest," from observations and conclusions formed after seven years' experience in the quarantine service, and an acquaintance with the Caribbean coast of Central America from Belize to Colon, I presume to offer some reflections and suggestions bearing upon quarantine.

In general terms, this coast of Central America may be said to be, with the exception of a few contracted and isolated points, low, swampy, and intensely malarious. Its numerous rivers, shallow and unnavigable, from the points from

which they debouch from the mountains, flow through dense, impenetrable, marshy jungles—the intervening territory an unbroken primeval forest, with an undergrowth of brush and vine that scarcely admits a ray of sunshine.

In striking contrast, the interior, beginning from a point a few hundred to a thousand feet above the sea level, presents an entire change in the aspect of the country, to open forests and pampas, clear, unobstructed streams, with a temperature varying from 60° F. at night to 78° at midday—conditions that conduce to the highest degree of health. The resident of the interior, taught by experience, is as keenly alive to the danger and as fearful of the dreaded “calentura” of the coast as are the citizens from Northern States of the dreaded invasions of yellow fever in the South Atlantic and Gulf seaports.

Now, the deduction: A citizen from the interior desires to go to the States or, elsewhere. He is subjected to the ten-day detention. At the end of the time (or perhaps from his ill-timed or inopportune arrival even a longer time has elapsed) he sails, having the local medical officer's health certificate, but he has been held in an infected locality, so to speak, and after a day or two at sea he develops a case of malaria. Arrived at his port of destination, the local medical officer finds him with high fever, gastritis, nausea and vomiting, perhaps also a jaundiced skin. Manifestly here is a case of at least grave suspicion. What officer will undertake to pronounce upon a momentary inspection whether this is or is not a case of yellow fever?

But “the greatest good to the greatest number” and prudence demand that the question be decided in the interest of the public health. The ship is held up and sent to quarantine, to the great discomfort, inconvenience, and distress of individuals and great financial loss to its owners and consignees.

I make this point in reference to and in the interests of the fruit trade, when one such case as depicted may be the cause of disastrous loss to the shippers; and, believing that the first principle of quarantine is or ought to be the facilitation of commerce to the utmost consistent with the public safety, I would respectfully recommend that the ten-day rule be abrogated, or at least left to the discretion of the medical officer, at least as concerns the interest of the Central American fruit trade.

Respectfully submitted.

L. A. WAILES, M. D.,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF TRANSACTIONS AT PORT LIMON, COSTA RICA—FRUIT PORT.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Port Limon, Costa Rica, Central America, October 6, 1899.

SIR: I have the honor to report that work was begun at this station on April 1, 1899.

The equipment consisted of 1 formaldehyde autoclave, 1 carboy of formalin mixture, and 1 carboy (100 pounds) of plain formalin, the former for use with the autoclave, furnished by the Department.

The one-story frame building used was suitably located, being isolated and a very short distance from the wharves of the port.

One-half of its floor space in the rear, 12 by 12 by 12 feet, was partitioned off and the entire space double ceiled with 3-inch well-seasoned flooring, with an intervening layer of glazed hardware paper. It is practically air-tight.

There is only one emp oyee, an intelligent colored man, who in past quarantine seasons has been employed in the same capacity.

Persons desiring passage on ships for southern ports of the United States made application to me in person, and when satisfied as to health of said applicants, and

that they had not been in an infected locality for the past thirty days, and that the personal effects had not been exposed to infection, an "identification card" was issued and the baggage disinfected before going on board the ship.

Any unusual or unnecessary amount of baggage, bedding, or household effects of any kind was prohibited.

It should be stated that first-cabin passengers only were permitted to take steamers for New Orleans, no other line of steamers being available.

Passengers' baggage that had been personally examined and passed was then subjected to fresh formaldehyde vapor for at least four hours and forwarded direct to the vessel about to leave port.

Passengers were for a second time examined, as well as the crew of the outgoing ship, and their "identification cards," together with sealed reports to the Louisiana State board of health and the Mississippi River quarantine station, were handed to the master of the vessel.

As arranged, there is little or no danger of baggage becoming reinfected, as after disinfection it is immediately transferred to the ship just prior to departure.

Inclosed herewith is a blank "identification card" and also blank "health certificate" in use during this quarantine season.

All United States consular bills of health issued from this port receive my indorsement, and the triplicates are forwarded to the Supervising Surgeon-General of the United States Marine-Hospital Service.

There have not been any vaccinations at this port. Thirty-six steamships have been inspected bound for ports south of the southern boundary of the State of Maryland.

Fifty-nine passengers were inspected and 82 pieces of baggage were inspected and disinfected from April 1 to June 30, 1899. Subsequently, from July 1, 1899, to October 5, 1899, 34 steamships and 51 passengers were inspected; also 79 pieces of baggage examined and disinfected.

It may be stated that with the completion of the sanitary improvements commenced about four years ago by the Limon Improvement Company the construction of a sea wall, the proper grading of the streets, the greatly increased supply of good water by underground pipes, and also a system of drainage, all nearing completion, should make Port Limon one of the healthiest cities in Central America.

Respectfully, yours,

WM. H. CARSON,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF TRANSACTIONS AT BOCAS DEL TORO, COLOMBIA—FRUIT PORT.

OFFICE OF MEDICAL OFFICER IN COMMAND M. H. S.,

Bocas del Toro, Colombia, October 14, 1899.

SIR: In response to Bureau letter of September 20, I have the honor to transmit the following report of work performed at this station:

From April 1 to June 30, 1899, inclusive.

Number of vessels inspected	58
Cleared for Mobile	38
Cleared for New Orleans	17
Cleared for Galveston	3
Number of passengers inspected	51
Bound for Mobile	44
Bound for New Orleans	5
Bound for Galveston	2
Number of pieces of baggage disinfected	82

From June 30 to October 14, 1899.

Number of vessels inspected	56
Bound for Mobile	46
Bound for New Orleans	10
Number of passengers inspected	52
Bound for Mobile	43
Bound for New Orleans	9
Number of pieces of baggage disinfected	102

There have been no vessels disinfected at this port. The work here has consisted chiefly in the inspection of vessels engaged in the fruit trade, plying between this port and the southern ports of the United States, and in the enforcement of the special regulations governing such vessels established by the United States Marine-Hospital Service under date of March 20, 1899. My endeavors have been directed to seeing that all ships were discharged of the cargoes and loaded with fruit with as little communication with the shore as possible.

Ships on their arrival here anchor at a distance of 200 to 300 yards from shore, and only such communication with the shore is allowed as is absolutely necessary for the working of the ship, and that only under proper supervision. On the evening previous to the arrival of the steamer the clothing and effects of all laborers and employees intended to go aboard are placed in the disinfecting chamber and subjected to formaldehyde gas generated in an autoclave and turned in under 40 pounds pressure, and allowed to remain until needed, generally from twelve to eighteen hours. The disinfecting chamber is a room containing nearly 1,000 cubic feet of air space, in a building placed at my disposal by the Snyder Banana Company. The room has a double floor, and ceiling and walls are thickly overlaid with paper. Adjoining is a small room in which stands the autoclave and disinfecting material.

On the arrival of a vessel it is boarded by the customs officials and a permanent customs guard placed aboard. I then go aboard and inspect the hold, the cabins, and the forecabin. Absolute cleanliness of the hold after each cargo of fruit has been discharged is a point I strongly insist on with shipmasters. The crew is mustered on deck and each individual examined. If the ship brings cargo, a small gang of laborers is allowed to go on board to discharge it, which consumes generally only a few hours. After proper inspection, the loading gang, from 30 to 40 men, go aboard and remain until the ship has received its full cargo in its round to the various points in the lagoon.

Then for twenty-four to thirty-six hours the vessel passes from under my personal observation; but as the regulations are very favorable to a quick dispatch of the ship, I have every reason to believe that they are strictly carried out. They keep everyone on board at his work and prevent outsiders from boarding the ship and interfering with work that requires promptness and dispatch.

If the ship, as sometimes occurs, lies here in port three or four days before proceeding to the lagoon, another muster and inspection of the crew is made just prior to departure for the lagoon. On the ship's return crew and ship are inspected again, and if any sickness is found it is noted in the certificate issued to the ship. On final departure each ship is furnished with a certificate according to form herewith.

All persons desiring passage on these ships are required to present themselves ten days prior to the sailing of the ship, and to remain under observation during that time. No passenger traffic whatsoever to or from the lagoon is permitted. All baggage of passengers who have complied with the above regulations is placed in the disinfecting chamber the evening previous to the day of sailing and subjected to formaldehyde gas, and allowed to remain therein until the ship sails, generally twelve hours. All trunks, valises, etc., are opened and the clothing

removed and hung upon lines. Bedding, blankets, pillows, and household furniture have been strictly barred shipment. Each passenger is provided with a certificate made out according to form herewith.

On several occasions I have refused to permit vessels to go to Colon and return here to clear for ports in the United States. I have also prohibited tugs and other craft which go to Colon to lie alongside vessels subject to the Marine-Hospital Service regulations.

Although there has occurred no disease of an infectious or contagious nature here, this port has been threatened by the outbreak of yellow fever at Panama. When first apprised of the existence of yellow fever at Panama I strongly advised the establishment of quarantine against Colon, with which place Bocas has considerable communication. On the solicitation of the leading merchants the authorities here readily promised to place all vessels under a period of detention. A very short time, however, sufficed to prove that this would not be carried out, and I was forced to keep, as far as in my power, a personal supervision over this traffic by keeping in touch with the owners of vessels plying between the two ports. There was not at any time a single case of sickness aboard any of these vessels nor any occurrence to arouse suspicion of infection being brought here. Vessels make the trip in from three to five days from Colon, with one exception, a steam tug, which makes it in twenty-four hours. This vessel, however, is under my personal supervision.

I would add that all shipmasters and fruit exporters have cheerfully cooperated with me in the enforcement of all the regulations, and no complaints have ever been made on either side. In fact all those interested have assured me that the regulations have been greatly to their advantage.

Respectfully submitted.

HERMAN B. MOHR,

Acting Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure No. 1.]

FORM OF CERTIFICATE ISSUED TO VESSELS.

MARINE-HOSPITAL SERVICE,

Bocas del Toro, Colombia, ———, 1899.

This is to certify that I have examined the ———, master, which arrived at Bocas del Toro from ——— the ——— day of ———, 1899, and which sails this day for ———.

Her crew consists of ——— men, including the master, and all are now in good health ———.

Said ——— is now in good sanitary condition. She brought ——— passengers from ——— and has ——— passengers now on board for the return voyage, all now in good health.

Name: ———. Whence: ———. Destination: ———.

She has now on board for transportation to ——— a cargo consisting of ———, in good sanitary condition.

After careful observation and inquiry, I believe and so certify that said ———, her officers and crew, have complied with all the rules of the United States Marine-Hospital Service for the government of vessels while at fruit ports.

I further certify that the health of Bocas del Toro and the adjacent country is good, and that no contagious or infectious disease prevails here.

—————,
Acting Assistant Surgeon, U. S. M. H. S., Sanitary Inspector.

[Inclosure No. 2.]

FORM OF CERTIFICATE ISSUED TO EACH PASSENGER.

MARINE-HOSPITAL SERVICE,
Bocas del Toro, Colombia, ———, 1899.

This is to certify that ——— leaves this port as a passenger on board the ———, ———, master, which sails this day for ———.

Said ——— has been under my observation for ten days, and is now in good health. His baggage has been disinfected under my supervision. His ultimate destination in the United States is ———.

Acting Assistant Surgeon, U. S. M. H. S., Sanitary Inspector.

REPORT OF TRANSACTIONS AT LA CEIBA, HONDURAS FRUIT PORT.

OFFICE OF MEDICAL OFFICER IN COMMAND,
La Ceiba, Honduras, October 1, 1899.

SIR: September 16, 1899, in answer, I have the honor to report that I arrived at this port April 3 last, and commenced work the same day. I found here as equipment a fumigating house, approximating a capacity of 1,000 cubic feet, in a miserable state of repair, having been nearly torn to pieces by a winter hurricane. Said fumigating house contained two obsolete formaldehyde lamps, one the property of S. Otesí & Son, the other of Wachecki Brothers, both of New Orleans, rivals in the fruit business, and neither allowing the other the use of the lamp. There was about a gallon of the formaldehyde solution left over from the last season. This house belonged in part to several parties—Wachecki, Otesí, and Pedro Devaux & Co., of this place. After consultation with Dr. W. K. Fort, the representative of the Louisiana State board of health, I was permitted to assume full charge of the fumigating house and outfit. The house itself was then put in a state of efficiency, a new supply of material purchased at the expense of these companies, and the work was then commenced and carried on subject to the instructions given me prior to my departure from the United States.

Early in May there was sent me from the Department at Washington an autoclave with two carboys, one of formalin mixture, for use in said autoclave, and one carboy of plain formalin, to be used in sprinkling clothing when occasion for use of the gas was not plainly and decidedly indicated. The lamps just mentioned were immediately laid aside and the autoclave substituted, being put in a recess outside of the main fumigating house; this in accordance with the directions received from the Bureau at Washington. About this time the United Fruit Company was formed, buying out the rival lines. Early in June the Bluefield Steamship Company appeared upon the scene, and trouble immediately commenced. Notwithstanding the urgent protest of the United Fruit Company, I continued to use the house, their property, for the fumigation of baggage and effects common to both companies, when early in July Mr. Bier, the general agent of the Bluefield Steamship Company here, built a new fumigating house, according to my design, and allowed its use for both companies. This is now in use, is up to date in its build and equipment, and affords entire satisfaction.

I have one employee, the man who operates the autoclave under my direction. Other methods of disinfection, such as sprinkling clothing of laborers and passengers, is done by myself. I have no apparatus adequate to the work of fumigating or disinfecting a ship, and indeed such action has not been called for or deemed necessary as yet. Ships here anchor one-half mile offshore in open roadstead; little intercourse with shore permitted. Laborers carry no effects with them, and all loading and unloading is done through the medium of launches. There are no wharves or piers here. I give certificates in triplicate to ships, and in duplicate to

passengers, also a crew list in duplicate to each vessel. In every instance a copy of such certificates and crew list is forwarded the Supervising Surgeon-General United States Marine-Hospital Service, Washington, D. C., and goes upon the vessel to which the certificate is issued, as per my instructions. A copy of these certificates and crew lists are herewith inclosed. I append list of vessels inspected at this port up to June 30, the second list from July 1 to October 1, inclusive. Finally, I report a satisfactory condition of public health here at this port.

Respectfully, yours,

WM. T. HAMILTON,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

List of vessels inspected.

April 3. Steamer *Agnes*; Norwegian; Cromwellian, master; Charleston.
 April 5. Steamer *Bergenseren*; Norwegian; Bentzen, master; New Orleans.
 April 6. Steamer *Anselm*; British; McFarlane, master; Mobile.
 April 7. Steamer *Pizzati*; American; Torgusen, master; New Orleans.
 April 14. Steamer *Foxhall*; American; Leslie, master; New Orleans.
 April 19. Steamer *Anselm*; British; McFarlane, master; New Orleans.
 April 20. Steamer *Agnes*; Norwegian; Cromwellian, master; Charleston.
 April 21. Steamer *Pizzati*; American; Torgusen, master; New Orleans.
 April 21. Steamer *Bergenseren*; Norwegian; Bentzen, master; New Orleans.
 April 26. Steamer *Foxhall*; American; Leslie, master; New Orleans.
 April 27. Steamer *Alliance*; Norwegian; Neilsen, master; Charleston.
 April 29. Schooner *A. M. Lawrence*; American; Baker, master; Mobile.
 May 3. Steamer *Rover*; American; Columbo, master; New Orleans.
 May 5. Steamer *Bergenseren*; Norwegian; Bentzen, master; New Orleans.
 May 10. Steamer *Pizzati*; American; Torgusen, master; New Orleans.
 May 12. Steamer *Foxhall*; American; Leslie, master; New Orleans.
 May 15. Steamer *Rover*; American; Columbo, master; New Orleans.
 May 23. Steamer *Wanderer*; American; Stevensen, master; New Orleans.
 May 23. Steamer *Bergenseren*; Norwegian; Bentzen, master; New Orleans.
 May 27. Steamer *Pizzati*; American; Larsen, master; New Orleans.
 June 5. Steamer *Rover*; American; Columbo, master; New Orleans.
 June 7. Steamer *Wanderer*; American; Stevensen, master; New Orleans.
 June 7. Steamer *Alliance*; Norwegian; Neilsen, master; New Orleans.
 June 11. Steamer *Hiram*; Norwegian, master; Newport News.
 June 12. Steamer *Pizzati*; American; Larsen, master; New Orleans.
 June 18. Steamer *Rover*; American; Columbo, master; New Orleans.
 June 20. Steamer *Condor*; Norwegian; Ubrig, master; New Orleans.
 June 25. Schooner *A. M. Lawrence*; American, master; Baker; Mobile.
 June 26. Steamer *Pizzati*; American; Larsen, master; New Orleans.
 June 30. Steamer *Foxhall*; American; Leslie, master; New Orleans.
 June 30. Schooner *M. S. Smith*; Marcial, master; Mobile.
 July 5. Steamer *Condor*; Norwegian; Ubrig, master; New Orleans.
 July 7. Steamer *Bergenseren*; Norwegian; Bentzen, master; New Orleans.
 July 11. Steamer *Jarl*; Norwegian; Petersen, master; New Orleans.
 July 14. Steamer *Pizzati*; American; Larsen, master; New Orleans.
 July 16. Steamer *Alliance*; Norwegian; Neilsen, master; passengers, 6; New Orleans.
 July 23. Steamer *Bergenseren*; Norwegian; Bentzen, master; New Orleans.

July 24. Steamer *Sunnira*; Norwegian; Johnansen, master; passengers, 5; New Orleans.

July 26. Schooner *Dyer*; British; Borden, master; Mobile.

July 28. Steamer *Franklin*; Norwegian; Rasmussen, master; New Orleans.

July 29. Schooner *San Otiri*; American; Traverse, master; New Orleans.

July 31. Steamer *Alliance*; Norwegian; Neilsen, master; New Orleans.

N. B.—There was no list of passengers or baggage kept during the months of April and May—later the list was made a record.

June: Twelve passengers; 16 pieces of baggage.

July: Twelve passengers; 18 pieces of baggage.

August: Thirteen passengers; 23 pieces of baggage.

September: Six passengers; 10 pieces of baggage.

August 5. Steamer *Joe Oteri*, American; Marulo, master; passenger, 1; New Orleans.

August 5. Steamer *Condor*, Norwegian; Uhrig, master; New Orleans.

August 8. Schooner *A. W. Lawrence*, American; Baker, master; Mobile.

August 8. Steamer *Bergenseren*, Norwegian; Bentzen, master; New Orleans.

August 14. Steamer *Alliance*, Norwegian; Neilsen, master; New Orleans; 10 passengers.

August 17. Steamer *Condor*, Norwegian; Uhrig, master; New Orleans.

August 21. Steamer *Joe Oteri*, American; Marulo, master; New Orleans.

August 24. Steamer *S. Oteri*, American; De Luca, master; passenger, 1; New Orleans.

August 25. Steamer *Bergenseren*, Norwegian; Bentzen, master; New Orleans.

August 29. Steamer *Condor*, Norwegian; Uhrig, master; passenger, 1; New Orleans.

September 2. Steamer *Foxhall*, American; Reid, master; 4 passengers; Newport News.

September 4. Steamer *Joe Oteri*, American; Marulo, master; New Orleans.

September 8. Steamer *Berrefond*, Norwegian; Billinsen, master; 1 passenger; New Orleans.

September 12. Steamer *Condor*, Norwegian; Uhrig, master; New Orleans.

September 13. Steamer *Bergenseren*, Norwegian; Bentzen, master; Mobile.

September 15. Steamer *Alliance*, Norwegian; Neilsen, master; Charleston.

September 16. Schooner *Santo Oteri*, American; Traverso, master; New Orleans.

September 18. Steamer *Joe Oteri*, American; Marulo, master; 1 passenger; New Orleans.

September 20. Steamer *Elliot*, British; (special inspection) coastwise.

September 25. Steamer *Sunnira*, Norwegian; Johnansen, master; New Orleans.

September 29. Steamer *Condor*, Norwegian; Uhrig, master; New Orleans.

LA CEIBA, HONDURAS, November 1, 1899.

In concluding my report of the operations at this port to date, I have the honor to state that there is no bureau of vital statistics here, and no fund from which to draw official data. The data, therefore, which are available are unofficial and only approximate in their nature, although at the same time possessed of value because they are confirmed by my own personal observation.

My original estimate of population here was taken from professional sources, but was too high; 2,500 is nearer the mark than 3,500. It is utterly impossible to obtain the birth rate here. During my seven months' residence among this people there have been from 40 to 45 deaths from all causes, these deaths being almost equally divided between adult life and childhood. The diseases occurring in this town and vicinity in their relative frequency may be stated as malaria in all its

forms, pneumonia, phthisis pulmonalis, croup, vermes, indigestion, diarrhea, dysentery, and other bowel troubles. Typhoid fever I have not seen. I have seen one case of meningitis. Pertussis has been epidemic here among children, but in mild form, with little or no complication, and no great attention was given to it. Yellow fever is an exotic along and upon this coast, but its last visitation is well remembered and frequently mentioned here; and owing to the exceedingly lax ideas that obtain here upon the subjects of practical sanitation and quarantine, both among officials and laity, it might, if carelessly introduced, repeat its horrors any season under favoring conditions.

Of the immediate causes of death here, I would give prominence to and place in sequence the following: Among adults, the continued form of malarial fever with or without complications, pneumonia, phthisis pulmonalis, asthenia following long-sustained chronic affections, with improper care and want of medical attention. This is not a good climate for children. The care, or rather want of care, among natives for their children is reprehensible in the extreme. Infants frequently die here from utter neglect, from the want of sustained, intelligent effort. Children of tender years are allowed to run about with little or no clothing; and this, even in a tropical climate, by no means accords with reason or common sense, and frequently in itself sows the seeds of disease. Pneumonia, bronchitis, croup, indigestion, asthenia, fevers, worms, cholera infantum, literal starvation, all help to shorten their young lives.

Beyond the mountain chain in the interior, I am informed, the conditions favor healthfulness and longevity, and many very old people are seen.

We have here the colonial English, the American, and the Carib negroes. They one and all constitute a good class of labor, strong, active, and healthy, and the latter are most excellent sailors. The death rate among them is very low.

In conclusion, the health conditions here are worthy of remark. Consider the character of the people, the nature of the climatic environment, the questionable source of the water supply, the kind and quality of food ingested, the utter lack and ignorance of practical sanitary institutions or practice, their abuse of alcoholic stimulants under a tropical sun, etc., and it is a matter of wonder that there is not more sickness. The porous nature of the soil, the diurnal alternation of land and sea breeze, the frequent storms from the Caribbean Sea, the regular and at all times heavy rains, together with a uniform temperature, may in a large measure account for the sanitary condition, which, in the main, is satisfactory.

My inspection list to October 31, 1899, is appended hereto.

Respectfully, yours,

WM. T. HAMILTON,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.

La Ceiba, Honduras, November 1, 1899.

List of vessels inspected October 1 to 31, 1899, inclusive.

October 2. Steamer *Joe Oteri*, American; Marulo, master; New Orleans; crew, 18; passengers, 2; baggage, 4 pieces.

October 3. Schooner *Herrick*, American; Peters, master; Tampa, Fla.; crew, 8; no passengers. (Subject of special report.)

October 4. Steamer *S. Oteri*, American; De Luca, master; New Orleans; crew 28; passengers, 5; baggage, 8 pieces.

October 6. Steamer *Simon Desmoines*, Norwegian; ——— master; New Orleans; crew, 17; no passengers.

October 11. Steamer *Sunnira*, Norwegian; Johnansen, master; crew, 14; passenger, 1; baggage, 2 pieces; New Orleans.

October 14. Steamer *Condor*, Norwegian; Uhrig, master; crew, 15; passenger, 1; baggage, 9 pieces.

October 18. Steamer *Alliance*, Norwegian; Neilsen, master; crew, 17; for Charleston, S. C.; no passengers.

October 20. Steamer *Joe Oteri*, American; Hunterman, master; New Orleans; crew, 18; no passengers.

October 26. Steamer *Sunnira*, Norwegian; Johnansen, master; New Orleans; crew, 14; no passengers.

October 31. Steamer *Condor*, Norwegian; Uhrig, master; New Orleans; crew, 15; passenger, 1; baggage, 1 piece.

All of which is respectfully submitted.

Respectfully, yours,

WM. T. HAMILTON,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF TRANSACTIONS AT LIVINGSTON, GUATEMALA—FRUIT PORT.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Livingston, Guatemala, October 8, 1899.

SIR: In compliance with your communication of September 16 and received a few days ago, I have the honor to make the following report of operations at this station:

In response to orders, I arrived at this place on March 28 last, reported at the consular agency, and as soon thereafter as possible initiated a quarantine. The only equipments for the work were those under control of the State boards of health of Louisiana and Alabama. The former had an autoclave, once fairly good, but now burned out and of little use. The Alabama board owned only a lamp, which I considered worthless and refused to use. Nevertheless, with this imperfect and most unsatisfactory condition of things, I enforced the regulations as best I could. After two and one-half months I received the autoclave, etc., forwarded by you, and since that time everything has gone on quite satisfactorily.

The fumigating rooms I found well suited for the purpose. There is a wharf about 200 yards in length, and the disinfecting plant is established on the dock, at the extreme end of it. The largest steamers come alongside the dock. The plant is operated at Puerto Barrios, where it was originally located by the Louisiana State board of health. Barrios is the terminus of the Northern Railroad and is about 12 miles across the Gulf. Inasmuch as there were daily trips made by a little mail steamer, and I had never been authorized by the service to make any expenditures, I permitted things to go on as formerly and made trips as often as necessary. The quarantine officer also originally lived at Barrios, but it proved such an unhealthy place, and the accommodations were of such a character that the domicile of the officer was removed to this place, which is much preferable from every standpoint. Livingston is the capital of this department, and is therefore the most important town in it. The governor and various officials reside here, and diplomatic representatives of America, England, and Germany. The only place of accommodation in Barrios is a hotel, so called, which is in a disgusting condition. No effort whatever is made to keep the water-closets and premises generally in a moderately decent, much less sanitary, condition. I consider that a man absolutely takes his life into his own hands who will undertake to reside

there continuously for six or eight months. Recently a new mail contract was entered into, and since September 15 our little steamer only makes the trip every other day, which is a most inconvenient arrangement for me and necessitates my spending more time in Barrios than I like.

Only one man is employed at the plant. He attends to the autoclave, looks after baggage, etc.

No vessel is employed in the duties of the station.

Persons presenting themselves for passage are required to present medical certificates as to their physical condition and whereabouts during the ten days immediately preceding. For this purpose I have designated physicians in some of the large towns, whose certificates I recognize. Persons from Guatemala City and beyond are required to have their certificates indorsed by a consular representative of the United States. To each person I present an identification card, giving his name, nationality, age, etc. This card has to be presented at the ticket office before he can secure passage, and also has to be presented at the vessel before he is allowed to go aboard. On the back of the card I note the disinfected baggage of the party.

For disinfection we use formaldehyde at a pressure of 40 pounds for twenty-five minutes. Everything is thoroughly exposed and remains so for six hours. The baggage is kept in the room until the steamer comes alongside, and is put right aboard. I have not stopped travel between this place and other towns on the coast, but in order to prevent any possible infection of the vessel the same restrictions apply as to persons going to the States.

The steamers that run regularly along this coast are fruit as well as passenger and mail steamers. When it is necessary to take on laborers here to handle the fruit, they are required to put on disinfected suits immediately before going aboard. There were no vaccinations down here during the season.

As I stated before, quarantine was instituted on April 1 last. From that date to June 30 we inspected 137 passengers going north and disinfected for same 274 pieces of baggage. The number of vessels going to southern ports during the same period was 23; none of them required disinfection. In addition there was one steamer a month from New York and one from Hamburg, Germany. These I usually visited, but made no report of.

From July 1 to present date (October 8) we have sent north 106 passengers and disinfected 176 pieces of baggage.

During the entire season, then, to this date we have sent north 243 passengers with 450 pieces of baggage. During the season, as nearly as I can get at it, we have sent south about 75 passengers with 125 pieces of baggage. This gives us a total of about 318 passengers and 575 pieces of baggage. Of those going north, 29 passengers with 41 pieces of baggage stopped in Belize. Up to date Mobile has had 7 passengers with 7 pieces. There were then 207 through passengers for New Orleans with 402 pieces of baggage.

Respectfully, yours,

NORWOOD K. VANCE,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Livingston, Guatemala, October 31, 1899.

SIR: In accordance with instructions, I herein report operations at this port from the 8th instant to date. (My report up to the 8th instant has already been transmitted.)

Six vessels have cleared for southern ports, viz, three for New Orleans, two for Mobile, and one for Calveston, carrying 21 passengers and 40 pieces of baggage.

The general health conditions are good; no contagion or infection whatever. While the operations at this port are not extensive, it is a point of utmost importance to the United States by reason of the fact that a considerable number of people pass out through this port, both from Salvador and from the Pacific side of this Republic—a territory in which there is more or less of yellow fever every year.

Respectfully, yours,

NORWOOD K. VANCE,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF TRANSACTIONS AT BLUEFIELDS, NICARAGUA—FRUIT PORT.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Bluefields, Nicaragua, October 5, 1899.

SIR: In compliance with Bureau letter of September 16, 1899, I have the honor to submit this my report for the fiscal year ended June 30, 1899:

This station was opened for work at the beginning of the quarantine season, April 1 last. The equipment for the work consists of a room 10 by 10 by 12 feet, made, as far as possible, air-tight. Wires are stretched from wall to wall 18 inches apart at varying heights from the floor, and adjoining this is another room, in which is kept an autoclave of most modern pattern and the formalin solution for disinfecting. All persons applying for passage to ports of the United States are required to present themselves to the acting assistant surgeon, United States Marine-Hospital Service, for inspection at least ten days prior to the date of their intended departure, and must be under his personal supervision during these ten days. The afternoon before a ship is to sail persons entitled to passage must have their baggage in the disinfecting room, where clothing taken from the trunks, valises, bags, etc., is hung upon the wires, the trunk and other containers left open, the door of the inner room closed, and through the keyhole is put the copper tube attached to the autoclave. Into this autoclave is poured 20 ounces of the chloroglycoformol mixture. This is heated until a steam pressure of 40 pounds is obtained, when the gas is turned into the room and allowed to flow until all of the mixture has gone over. The contents of this inner room are not disturbed until morning, thus giving them at least twelve hours exposure to the gas—longer than is necessary, but a convenient and effective arrangement. The same process is applied to the clothing of a set of laborers for each fruit vessel just prior to its going up the Escondido River for fruit.

The acting assistant surgeon visits each vessel after it comes down the river, inspects it as to general cleanliness and sanitary condition, inspects the crew as to state of health, and if all is satisfactory gives a certificate to that effect in duplicate, a triplicate being sent to the Surgeon-General Marine-Hospital Service. To each passenger is given a certificate of his or her compliance with the rules and regulations of the Marine-Hospital Service. Copies of these blank forms are inclosed.

From April 1 to June 30, 1899, 37 vessels were inspected, 118 pieces of baggage for 62 passengers were disinfected, also the clothing of 30 laborers for each of the above 37 ships. Ninety of these laborers were vaccinated, as they could show no evidences of recent and successful vaccination. The annual death rate for Bluefields, with its 3,018 population, was 18.55 per thousand.

For the first quarter of the new year ended October 1, 39 vessels were inspected, 198 pieces of baggage for 100 passengers were disinfected, and the clothing of the laborers on each ship. No persons were vaccinated during this period.

This quarter being wholly included in the rainy season, the death rate shows material increase, reaching 30.5 per thousand per annum.

Respectfully, yours,

D. W. GOODMAN,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF TRANSACTIONS AT BELIZE, HONDURAS—FRUIT PORT.

BELIZE, HONDURAS, *October 5, 1899.*

SIR: I have the honor to submit this my report for the fiscal year ending June 30, 1899:

I arrived in Belize March 27, 1899, and took charge of the station. The active quarantine work began on April 1, 1899.

There are two steamship lines running regularly to this port, one from New Orleans and the other from Mobile.

I found two plants for fumigating purposes located in different localities, which were very inconvenient, and found that unless I built an independent plant at the expense of the Government I would be compelled to use those on hand. I have adopted the latter procedure. In the case of any steamer outside of the two rival lines I have to take the responsibility in managing the fumigation. I would suggest, therefore, the advisability of constructing an independent chamber for future use. It is difficult to manage such business. The Service should build its own plant and be independent of all lines. A proper plant could be arranged to handle all of this business for about \$100.

In regard to boarding vessels in the harbor. I have used sloops, the fee charged being about 50 cents per trip. I would prefer to have my own boat, with a crew consisting of a man and boy, who could also attend to the disinfecting plant and all labor connected with the Service. The wages for the man and boy would be \$20 per month. Belize is so situated that it is in constant communication with South America by sailing and steam vessels at all times. By great vigilance yellow fever has been kept out for several years, and as the plague gradually approaches this continent I think Belize is in the line, and it would be well to keep close guard on the place. There is at present a railroad projected here, and it is expected that work will commence in February, consisting of dredging the harbor and grading the road, which, in my opinion, will place Belize in the position to be overrun with yellow fever, as have Panama and Greytown and other places. The mud from the harbor will be used for filling low ground.

I have examined a place to-day which I have had in view for some time, and would recommend it for a plant and office. The rent will be \$20 per month, if leased for two years. It will be large enough for an office and fumigating plant, and all wharf privileges included can be arranged very cheaply.

Steamers inspected sailing for United States ports.....	56
Sailing vessels inspected sailing for United States ports.....	8
Passengers.....	150
Pieces of baggage.....	200

All the baggage was inspected and disinfected as per regulations. Nine hundred and forty-eight laborers were shipped from Belize, with 948 baskets containing clothing. All the latter were disinfected.

The methods of inspection from outlying districts, which have been carried out, consist in keeping all passengers under observation ten days before embarking. All passengers from the town of Belize report ten days before embarking. Their

baggage is subjected to six hours' exposure to formaldehyde gas before going on board. The baggage is not allowed to be opened before reaching its destination.

I inclose blank forms which I have had printed and used during the season.

For a description of Belize I will refer you to page 1183 of Public Health Reports, under date of July 28.

I have on hand one autoclave, in good order; also about 10 gallons of solution. I inclose blanks "A" and "B," which I have used during the season. They should be made in book form, with perforated leaves that can be taken out, leaving the stub as a record.

This report is not as elaborate as I would have liked to make it, owing to the mail being late. I wish to call your attention to our mail facilities. The mail reaching New Orleans after Thursday morning remains there one week.

Respectfully yours,

C. W. KNIGHT,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

BRAZIL.

The sanitary inspector at Rio Janeiro, Brazil, has continued his work of inspecting vessels bound for the United States, and has transmitted weekly reports of the sanitary condition of that and adjacent ports, as well as numerous scientific reports, which have been published in Public Health Reports.

On account of an outbreak of plague an acting assistant surgeon has been appointed for duty at Santos, Brazil, and is now on his way to that port.

HAWAII.

The presence of plague and smallpox in the Far East and the danger of transmission of same to the United States, particularly through troops returning from the Philippines, necessitated the detail of an officer to Honolulu. The letter requesting the detail of Surgeon Carmichael in the office of the United States consul, duly approved by the President, together with the instructions issued and a preliminary report from the medical officer, were published in the Annual Report of 1898.

REPORTS FROM SURG. D. A. CARMICHAEL.

In accordance with his instructions, Surgeon Carmichael has transmitted a full report upon the sanitary conditions in Honolulu, under date of October 12, 1898. This report is not reproduced here, having been published in Public Health Reports of December 3, 1898, to which attention is invited.

Under date of November 29, 1898, Surgeon Carmichael transmitted an exhaustive report on leprosy in the Hawaiian Islands, which, with numerous illustrations, was published in the Public Health Reports of December 30, 1898.

Surgeon Carmichael also submitted reports (which were published

in the same manner) upon cases of plague occurring on steamships arriving from Hongkong and from Japanese ports at Honolulu. (See Public Health Reports of July 7, 1899.)

He has also submitted the following:

REPORT OF TRANSACTIONS AT HONOLULU, H. I.

[October 2, 1898, to October 31, 1899.]

SIR: All vessels leaving Honolulu for ports in the United States are inspected before giving the consular bill of health.

Particular attention is given to the examination of the Asiatic and European steerage passengers and the crews of the steamers plying between Oriental and United States ports.

The crews and passengers on all sailing vessels leaving Honolulu for ports in the United States are also inspected. Inspection is made prior to sailing, and the passengers and crew are mustered on deck in the usual way. It has been found more convenient to examine the steerage passengers of the steamship *Australia*, the local steamer between Honolulu and San Francisco, at the United States consulate. A pass card is then given which is presented by the passenger at the steamship ticket office.

Inspections were commenced on October 2, 1898, and have been continued to the present time. The United States has no quarantine establishment here, and no vessels for boarding or other quarantine purposes.

One medical officer is on duty in the United States consul-general's office, and he is allowed one attendant, who is detailed as office boy. In addition to his duties in connection with the issuance of bills and inspection of vessels he is constantly called upon to give medical advice and surgical aid in the case of sick and injured American seamen. He has also made special reports on leprosy and American shipping.

Although the Hawaiian Islands have been formally annexed to the United States, all of the Hawaiian local laws remain in force until further legislation by the United States Congress. All boarding and inspection of vessels arriving at Honolulu is therefore performed by the port physician, who is an official of the Hawaiian government. The position is a responsible one, owing to the large number of Asiatics admitted to labor on the Hawaiian sugar plantations.

The Hawaiian government still maintains sanitary inspectors at Hongkong, Amoy, Nagasaki, Kobe, and Yokohama. All Japanese and Chinese immigrants, before distribution to the different plantations, are obliged to undergo from fourteen to twenty-one days' detention at the quarantine station on Mauiola Island, where their clothing and baggage is disinfected. There is a disinfecting plant on the island for the use of steam and hot air. Sulphur dioxide and formalin are also used. The Hawaiian government also has a shed on the Pacific Mail wharf for the disinfection of freight by sulphur dioxide.

The United States has no means of disinfecting ships or their cargoes here at the present time. The health of the islands has been satisfactory during the year. In the past winter there was quite a large number of cases of enteric fever among the United States troops stationed here, and a few cases, as shown by the weekly health reports, occur among the civil population from time to time. A few cases of beriberi are noted, principally among the Japanese. Malarial fever occurs in certain districts, and tubercle claims quite a number of victims. Sporadic cases of dysentery are noted from time to time. An epidemic of a mild form of epizootic prevailed among the horses in Honolulu this autumn, and cases of glanders have been reported.

The leprosy question does not attract much attention here. For the two years ending January, 1900, between 140 and 150 new cases have been reported.

The situation at the leper settlement on Molokai presents no marked change from my last report. According to a census taken in this month (November) by Mr. Reynolds, agent of the board of health, there were in the settlement 1,023 lepers. In November, 1898, there were 1,073.

During the year three vessels were held in quarantine for smallpox and two for bubonic plague, all being trans-Pacific liners plying between Asiatic ports and San Francisco, Cal.

There is an urgent necessity for the early establishment of a marine hospital here with a contract station at Hilo, Hawaii, and a system of office relief at both places.

The care of tubercle of the lungs among American seamen is a puzzling problem at present in Honolulu. The Queen's hospital will not admit such cases. boarding-houses and hotels object to them, and it is always difficult for the United States consul-general to find a suitable place for these unfortunate seamen.

The transportation of United States troops to the Philippines and the return of such to the United States via Honolulu has greatly increased the business of the port.

Statistics.—From October 2, 1898, to June 30, 1899, 69 steamships and 195 sailing vessels: and from July 1, 1899, to October 31, 1899, 39 steamships and 86 sailing vessels were inspected, making a total from October 2, 1898, to October 31, 1899, of 108 steamships and 281 sailing vessels.

The steamships carried from Asiatic ports and the colonies 12,367 and from Honolulu 4,992 passengers for ports in the United States.

The crews of these steamships inspected numbered 8,662, and the nationalities of the vessels were—

American	51
British	44
Japanese	10
German	1
Norwegian	1
Russian	1

The sailing vessels inspected from October 2, 1898, to June 30, 1899, carried from Honolulu 152 passengers and 2,699 crew, and from July 1, 1899, to October 31, 1899, 73 passengers and 1,079 crew, making a total of 225 passengers and 3,778 crew from October 2, 1898, to October 31, 1899.

The nationalities of these vessels were—

American	241
Hawaiian	28
German	6
British	3
Norwegian	3

Statistical tables are inclosed, showing the number of steamers inspected, with details of passengers in transit and from Honolulu to United States ports.

The large number of passengers landed at Honolulu is made up principally of Japanese and Chinese brought here to work on the sugar plantations.

Respectfully,

D. A. CARMICHAEL,
Surgeon, Marine-Hospital Service,

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

Statistical table of steamers, passengers, and crews inspected at Honolulu, H. I., from October 2, 1898, to October 31, 1899.

Name of steamer.	Date of departure.	Destination in United States.	Passengers in transit to United States.	Passengers from Honolulu.	Total.	Landed in Honolulu.	Crews inspected.
1898.							
Aztec	Oct. 5	San Francisco, Cal.				715	44
Australia	do	do		33	33		105
U. S. transport Pennsylvania.	Oct. 6	do	14		14		90
Doric	Oct. 10	do	409	26	435	722	131
Mariposa	Oct. 12	do	42	64	106		73
Centennial	Oct. 28	Seattle, Wash.		7	7		50
City of Columbia	do	Seattle, Wash., via Hilo, Hawaii.		12	12		81
Belgie	Nov. 2	San Francisco, Cal.	384	15	399	680	135
Australia	do	do		127	127		102
Moana	Nov. 9	do	76	139	215	6	76
Coptic	Nov. 14	do	178	45	223	704	150
Hupeh	Nov. 29	do	1	1	2		52
Australia	do	do		604	604		105
City of Peking	Dec. 4	do	138	54	192	135	160
Alameda	Dec. 7	do	41	59	100	3	80
Gaelic	Dec. 9	do	214	36	250	192	145
China	Dec. 20	do	218	33	251	66	160
Australia	Dec. 27	do		100	100		93
Doric	Dec. 30	do	143	22	165	682	135
1899.							
U. S. transport Tartar	Jan. 2	do	9		9		96
Mariposa	Jan. 4	do	59	74	133	7	75
Nippon Maru	Jan. 7	do	64	36	100	521	190
Rio de Janeiro	Jan. 13	do	126	70	196	323	110
Lennox	Jan. 14	Portland, Oreg.	31		31	788	50
Australia	Jan. 24	San Francisco, Cal.		91	91		93
Aztec	do	do				143	45
Coptic	Jan. 26	do	214	32	246	495	145
Garonne	Jan. 30	Seattle, Wash.		42	42		94
Moana	Feb. 1	San Francisco, Cal.	94	125	219	7	80
America Maru	Feb. 3	do	120	21	141	514	170
City of Peking	Feb. 15	do	76	26	102	12	130
Gaelic	Feb. 21	do	126	32	158	26	155
Australia	do	do		118	118		93
Carlisle City	Feb. 24	San Diego, Cal.				646	62
Fansang	Feb. 25	Portland, Oreg.					50
Hongkong Maru	Mar. 1	San Francisco, Cal.	114	28	142	308	171
Alameda	do	do	82	61	143	14	76
Garonne	Mar. 7	Seattle, Wash.		42	42		87
China	Mar. 10	San Francisco, Cal.	233	91	324	391	155
Monmouthshire	Mar. 17	Portland, Oreg.	158		158	571	50
Doric	do	San Francisco, Cal.	227	45	272	244	140
Australia	Mar. 21	do		133	133		92
Nippon Maru	Mar. 26	do	185	23	208	54	180
Chantung	Mar. 27	San Diego, Cal.				12	40
Manuense	Mar. 31	Seattle, Wash., via Victoria.					35
Mariposa	do	San Francisco, Cal.	96	78	174	2	78
Rio de Janeiro	Apr. 5	do	182	31	213	55	110
Garonne	Apr. 7	Seattle, Wash.					77
Coptic	Apr. 11	San Francisco, Cal.	490	36	526	39	146
Elihu Thompson	Apr. 19	do					21
Australia	Apr. 20	do		406	406		105
America Maru	Apr. 21	do	275	48	323	347	170
Moana	Apr. 28	do	177		177		75
City of Peking	Apr. 29	do	337	41	378	74	135
Belgian King	Apr. 30	do	12		12	238	60
Garonne	May 9	Seattle, Wash.		42	42		76
Gaelic	May 13	San Francisco, Cal.	499	35	534	102	145
Australia	May 16	do		141	141		98
Taifu	May 17	do					45
Carmarthenshire	May 20	do	53	1	54	196	50
China	May 22	do	772	33	805	133	150
Alameda	May 27	do	76	38	114	15	80
Doric	June 2	do	553	38	591	189	145
Carlisle City	do	do	59		59	72	61
Australia	June 13	do		101	101		93
Rio de Janeiro	June 18	do	217	39	256	32	120
Nippon Maru	June 20	do	194		194		180
Mariposa	June 23	do	77	107	184	5	80
Coptic	June 27	do	473	41	514	433	145
			8,318	3,723	12,041	10,913	7,076

Statistical table of steamers, passengers, and crews inspected, etc.—Continued.

Name of steamer.	Date of departure.	Destinations in United States.	Passengers in transit to United States.	Passengers from Honolulu.	Total.	Landed in Honolulu.	Crews inspected.
	1899.						
America Maru	July 13	San Francisco, Cal.	162	5	167	483	170
Australia	July 14	do		134	134		98
Moana	July 21	do	104	106	210	10	75
City of Peking	July 28	do	174	20	194	628	140
Gaelic	do	do	316	34	350	250	145
U. S. hosp. ship Relief Thyra	July 24	do					
	July 25	San Diego via San Francisco.				387	45
Hongkong Maru	July 29	San Francisco, Cal.	19	11	30	306	171
Columbia	Aug. 5	Portland, Oreg				72	70
Australia	Aug. 8	San Francisco, Cal.		133	133		99
China	do	do	339	57	396	421	155
Belgian King	Aug. 15	San Diego, Cal.	26		26	381	60
Doric	do	San Francisco, Cal.	254	59	313	374	146
Elihu Thompson	Aug. 16	do					25
U. S. S. Boston	do	do					
Alameda	Aug. 18	do	106	52	158	19	80
Nippon Maru	Aug. 26	do	107	53	165	29	180
Río de Janeiro	Sept. 3	do	170	23	193	248	120
Carmarthenshire	do	San Diego, Cal.	13		13	605	61
Australia	Sept. 5	San Francisco, Cal.		99	99		95
Coptic	Sept. 11	do	590	40	630	216	145
U. S. transport Lalandon	Sept. 13	do					42
Elihu Thompson	Sept. 15	do					25
Mariposa	do	do	76	63	139	5	76
Lennox	Sept. 16	Portland, Oreg				701	50
Victoria	Sept. 22	San Francisco, Cal.					30
City of Peking	Oct. 2	do	238	62	300	494	135
Australia	Oct. 3	do		76	76		89
U. S. transport Centennial	Oct. 7	do	15		15		55
Gaelic	Oct. 8	do	364	27	391	234	121
Moana	Oct. 13	do	58	95	153	12	80
Hongkong Maru	Oct. 14	do	51	6	57	447	170
Elihu Thompson	Oct. 19	do					26
Carlisle City	Oct. 24	San Diego, Cal.	17		17	701	62
China	Oct. 25	San Francisco, Cal.	469	56	525	448	165
Dalry Vostock	Oct. 27	do	15		15	726	52
U. S. transport Ohio	do	do					97
Doric	Oct. 31	do	366	48	414	689	131
Australia	do	do		96	96		100
			4, 049	1, 360	5, 409	8, 886	3, 586
Total number of passengers and crews inspected from October 2, 1898, to October 31, 1899 (steamers)						17, 459	8, 862
Total number of passengers and crews inspected from October 2, 1898, to October 31, 1899 (sailing vessels)						225	3, 778
						17, 684	12, 640

PHILIPPINE ISLANDS.

The presence of United States troops in the Philippines, and the danger of importation to those islands of bubonic plague from Hongkong made it necessary to take unusual precautions with regard to the chief ports therein. Accordingly two complete outfits of disinfecting machinery have been shipped to Manila, where a plant will probably be erected. The following correspondence relates to this matter:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., October 19, 1899.

SIR: Learning that the transport *Thomas* is to sail from New York November 1 for Manila, and that this vessel is now at Philadelphia, I have to request that you

receive from the Kensington Engine Works at Philadelphia two steam disinfecting chambers, two sulphur fumigating furnaces, and accessories, to be consigned to the depot quartermaster at Manila subject to the orders of the Surgeon-General of the Marine-Hospital Service. These steam chambers are each 9 feet 6 inches in length and 5 feet in diameter. The sulphur furnaces are 8 feet long 4 feet high and 4 feet wide. There will also be two 20-horsepower boilers. The estimated weight of these two consignments is 50,000 pounds.

The presence of plague in Hongkong, and the possibility of its reaching the Philippines, is a matter in regard to which, under the law of February 15, 1893, the Treasury Department, through the Marine-Hospital Service, has definite responsibilities. It is my intention shortly, through the honorable the Secretary of the Treasury, to bring this matter to the attention of the honorable Secretary of War, more particularly with regard to the quarantine management at Manila, but in the meantime I consider it absolutely essential that these disinfecting appliances should be at Manila, both for the protection of the islands themselves and for the protection of the United States. I would request, therefore, that in giving authority to ship these appliances it be done with the knowledge and consent of the honorable Secretary of War.

Respectfully,

WALTER WYMAN,
Surgeon-General M. H. S.

QUARTERMASTER-GENERAL UNITED STATES ARMY,
War Department, Washington, D. C.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, October 23, 1899.

SIR: Referring to your letter of the 19th instant, requesting that two steam disinfecting chambers, two sulphur fumigating furnaces, and accessories, consigned to the depot quartermaster at Manila, be received from the Kensington Engine Works at Philadelphia and loaded on the army transport *Thomas* to be transported to Manila, you are respectfully informed, by direction of the Quartermaster-General, that the *Thomas* has left Philadelphia and is now in New York.

If the disinfecting chambers, furnaces, and accessories referred to are sent to pier 22, Brooklyn, they will be loaded on the ships to sail thence to Manila.

There are three army transports to sail from New York to Manila next month, viz, the *Thomas* November 5, the *Meade* November 15, and the *Logan* November 20.

The general superintendent army transport service, New York City, has been instructed to have the machinery put on these ships.

Respectfully,

CHARLES BIRD,
Quartermaster, U. S. A.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,
Washington, D. C.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., October 25, 1899.

SIR: In accordance with authority received from the office of the Quartermaster-General of the United States Army, on the 24th instant, I have to inform you

that the Kensington Engine Works of Philadelphia have been directed to ship two steam chambers, two boilers, and two sulphur furnaces, with engines, fans, and appurtenances complete, to pier 22, Brooklyn, N. Y., consigned to Maj. C. P. Miller, chief quartermaster. Manila, P. I. This action is taken with the knowledge and approval of the honorable Secretary of War.

I have to request that the freight be loaded on the transport *Thomas* which is to sail from Brooklyn November 5, 1899. It is important that all of the articles be shipped by the same vessel and I would, therefore, respectfully urge the necessity of forwarding them all by the transport *Thomas*, and if this is impossible, to forward all by the next transport bound for Manila.

Respectfully,

WALTER WYMAN,
Surgeon-General M. H. S.

Maj. F. B. JONES,
*General Superintendent Transport Service,
Army Building, New York, N. Y.*

[Indorsement.]

OFFICE OF THE QUARTERMASTER, PIER 22,
Brooklyn, N. Y., November 21, 1899.

Respectfully returned to the general superintendent army transport service, with the information that the consignment of machinery from the Kensington Engine Works, went forward to Manila on the *Logan* on the 20th instant.

ALFRED M. PALMER,
*Captain and Assistant Quartermaster, U. S. A.,
In charge of Pier 22.*

INSPECTION AT HONGKONG AND YOKOHAMA OF UNITED STATES ARMY TRANSPORTS FROM MANILA.

United States army transports, with troops returning from the Philippines, made Hongkong and Yokohama ports of call. The possible danger of infection of the vessels by reason of plague in those cities made it desirable that an inspection of the vessels be made by the medical officers on duty at those ports. Request was made of the honorable Secretary of War, which was granted, as shown by the following letters:

AUGUST 31, 1899.

SIR: I have to respectfully invite your attention to section 2. of an act entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," approved February 15, 1893, which states—

"That any vessel at any foreign port clearing for any port or place in the United States shall be required to obtain from the consul, vice-consul, or other consular officer of the United States at the port of departure, or from the medical officer, where such officer has been detailed by the President for that purpose, a bill of health in duplicate in the form prescribed by the Secretary of the Treasury, setting forth the sanitary history and condition of said vessel, and that it has in all respects complied with the rules and regulations in such cases prescribed for securing the best sanitary condition of the said vessel, its cargo, passengers, and crew. And said consul or medical officer is required, before granting such dupli-

cate bill of health, to be satisfied that the matters and things therein stated are true.

* * * * *

"The President, in his discretion, is authorized to detail any medical officer of the Government to serve in the office of the consul at any foreign port, for the purpose of furnishing information and making the inspection and giving the bills of health hereinbefore mentioned."

Section 3 of the same:

* * * * *

"The Secretary of the Treasury shall make such rules and regulations as are necessary to be observed by vessels at the port of departure and on the voyage, where such vessels sail from any foreign port or place to any place in the United States, to secure the best sanitary condition of such vessel, her cargo, passengers, and crew, which shall be published and communicated to and enforced by the consular officer of the United States."

Under the terms of the law quoted, paragraph 3, article 1, of the quarantine regulations issued by this Department provides that—

"Vessels clearing from a foreign port for any port in the United States, and entering or calling at intermediate ports, must procure at all such ports a supplemental bill of health, signed as provided in article 1. If a quarantinable disease should appear on board the vessel after leaving the original port of departure, or other circumstances presumably render the vessel infected, the supplemental bill of health should be withheld until such sanitary measures have been taken as are necessary."

The President, by authority of the law quoted, has detailed a medical officer of the Marine-Hospital Service for duty in the office of the consul at Hongkong, China. A sanitary inspector of the Marine-Hospital Service is now on duty at the port of Yokohama, Japan. These two places are ports of call for United States transports returning with troops from the Philippine Islands. Hongkong is infected with bubonic plague. Yokohama, Japan, is in close communication with the island of Formosa, where plague is also prevalent. By reason of these facts it is considered very desirable that United States transports from the Philippines, touching at either Hongkong or Yokohama, be inspected by the medical officers before mentioned, and a supplemental bill of health, as provided, be furnished to them. Such inspection it is believed would insure greater safety to the vessels themselves, and also less probability of conveying the plague to the United States.

I would therefore respectfully request that orders be issued to the commanding officers in the Philippine Islands directing them to have the masters of United States transports, when touching at either of the ports mentioned, permit the inspection by the medical officers of the Marine-Hospital Service, and secure from them the supplemental bills of health described.

Respectfully, yours,

L. J. GAGE, *Secretary*.

THE SECRETARY OF WAR.

WAR DEPARTMENT,
Washington, September 7, 1899.

SIR: I have the honor to acknowledge the receipt of your letter of the 31st ultimo, inviting attention to section 2 of an act entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," approved February 15, 1893, and requesting that orders be issued to the commanding officers in the Philippine Islands, directing them to have the

masters of United States transports, when touching at either Hongkong or Yokohama, to permit the inspection by the medical officers of the Marine-Hospital Service and to secure from them the supplemental bills of health described in the quarantine regulations issued by your Department.

In reply, I beg to state that orders in accordance with your request will be given.
Very respectfully,

ELIHU ROOT,
Secretary of War.

THE SECRETARY OF THE TREASURY.

[Inclosure.]

HEADQUARTERS OF THE ARMY, ADJUTANT-GENERAL'S OFFICE,
Washington, September 9, 1899.

SIR: The Secretary of War directs me to inclose copy of a letter of the honorable the Secretary of the Treasury, dated August 31, 1899, setting forth the desirability of an inspection of United States transports coming from the Philippines and touching at either Hongkong or Yokohama by medical officers of the Marine-Hospital Service, and to direct that you issue the necessary instructions to the end that the masters of the United States transports, when touching at either of the ports mentioned, shall permit the inspection by the medical officers of the Marine-Hospital Service and secure from them a supplemental bill of health as described.

Very respectfully,

H. O. S. HEISTAND,
Assistant Adjutant-General.

THE COMMANDING GENERAL,
*Department of the Pacific and Eighth Army Corps,
Manila, Philippine Islands.*

JAPAN.

SANITARY INSPECTOR AT YOKOHAMA.

The services of the sanitary inspector at Yokohama, Japan, have been continued during the past year, and he has submitted a number of valuable reports which have been published in the Public Health Reports of 1899. Particular attention is invited to his occasional reports upon epidemic dysentery. It is understood a complete report upon this subject is in preparation for publication during the ensuing year. Following is the annual report of the sanitary inspector, Dr. Stuart Eldridge:

REPORT OF TRANSACTIONS AT YOKOHAMA, JAPAN.

— OFFICE SANITARY INSPECTOR, U. S. M. H. S.,
Yokohama, Japan, October 20, 1899.

SIR: I have the honor to submit the following report of the operations of this office for the fiscal year ended June 30, 1899:

The position of Yokohama renders it, in some sense, the sanitary gateway of the Far East. Through this port passes all the travel from China, that center of infection, where epidemics rage with little or no effort made for their control, where plague and cholera seem to have become endemic, and smallpox, ever present, even when not epidemic, is carefully propagated by inoculation. Through it or from it go, too, all the Japanese passengers for United States ports in num-

bers already large and steadily increasing. The history of Japan during the past twenty-two years, with a record of cholera recurring annually with more or less severity, from 1877 to 1894, with occasional outbreaks of smallpox of wide distribution, and with yearly epidemics of malignant dysentery since 1880, which now attack the whole country, is scarcely reassuring from the sanitarian's point of view. Add to the foregoing perils the ever existing danger from leprosy and that of the once experienced outbreak of relapsing fever, and precautions of the most stringent character on the part of the United States seem fully warranted. It was, undoubtedly, a knowledge of these facts that induced you in 1894 to appoint a representative of the Bureau at this point.

Considerations based on the foregoing have led me to consider my duty in the broadest sense to endeavor to keep myself in touch with and to report to you the sanitary situation, not only of Yokohama itself, but of the country at large, and even, when conditions seemed to demand it, of China as well. How far I have succeeded in keeping your Bureau informed upon all points of special interest to it, you are most capable of judging. The recent and most advisable detail of an officer of the Marine-Hospital Service for duty at Hongkong, the most dangerous port in China, and the late appointment of a trained medical officer of health by the municipality of Shanghai, with the enforcement, for the first time in the history of that port, of reasonable precautionary measures against the importation or exportation of infectious disease, relieves me to a great extent of the sense of responsibility as regards China, and will, no doubt, add greatly to the effectiveness of such portions of the quarantine regulations as apply abroad.

The sanitary history of the past year in Japan has been one the chief interest of which is the continuance of the annual epidemic dysentery, upon which I shall not here dwell, as I have dealt with it somewhat exhaustively in my special report upon that subject; suffice it to say that the number of cases has of late been steadily increasing year by year, that it has invaded every province of the three large islands composing Japan proper—viz, Nippon, Shikoku, and Kiushiu—and that it has during the present season, and practically for the first time, attacked the people of Yezo (Hokkaido) also. The epidemic of 1899, which to October 18 amounted to 93,150 cases, with 19,130 deaths, and is still in active progress, will, undoubtedly, prove one of the most severe from which Japan has yet suffered.

Of cholera, though a few cases, so called, have been reported from time to time, painstaking investigation has convinced me that no genuine instance has occurred during the year. It is, in my opinion, very doubtful whether any real cholera has existed in Japan since 1894.

Of plague there is a practical certainty that not a single case has as yet been met with in Japan beyond those landed at the quarantine stations from vessels from China or Formosa. Five different importations of the disease took place in this manner during the year at the Nagasaki and Yokohama stations, but no secondary infection occurred even in the hospitals. With the exception of the dubious instance of the steamship *Nippon Maru*, fully noted hereafter, no fresh case has appeared on any of the ships concerned subsequent to their disinfection and quarantine.

But a few widely separated and truly sporadic manifestations of variola have taken place during the period covered by this report. The great smallpox epidemic of the winter of 1896-97 was, in my belief, and as I have already reported to you, due in large measure to the mistaken policy of the Government in having, some years previously, intrusted the administration of the production of vaccine to private and irresponsible parties. This outbreak has not only exhausted the greater part of the, at present, susceptible material, but has given a marked stimulus to the practice of vaccination, both primary and secondary. As the Govern-

ment has resumed control of the supply of virus, which is now furnished of the best possible quality and in quantity practically unlimited, there is, I think, little prospect of any serious development of smallpox in the near future.

In this connection I may state that the vaccine farms, the larger of which are near the cities of Tokyo and Osaka, are managed according to the latest methods. The cattle are carefully selected, medically inspected, tested by tuberculin, the inoculation and collection of the virus conducted under strictly antiseptic precautions, each lot of vaccine bacteriologically examined, and the emulsion, in which alone it is distributed, packed with all care.

At the end of 1898 I supplied to the army medical department in Manila sufficient liquid virus to vaccinate 25,000 men, and so far as I have been able to learn, it proved exceedingly active and in every respect of good quality. Many of the troops who had been vaccinated on the voyage outward by dry points with but few successes, responded promptly to the Japanese virus.

As smallpox has not been present in Yokohama or its neighborhood during the year, I have vaccinated only those steerage passengers or others who had been specially exposed on board ship, and where the operation had not already been satisfactorily performed by the surgeon of the vessel. As a rule, the regular liners have competent surgeons, of large experience in the practice of vaccination, and are supplied with reliable virus; and, consequently, the operation having been completed under these circumstances, I have not deemed it necessary or advisable to do more than to assure myself of this fact. The case is far different, however, in respect to the irresponsible marine tramps which, under temporary charter to various companies, carry a considerable proportion of the steerage passengers to United States or Hawaiian ports. If these ships have a surgeon at all, he is, if a European, often of most unreliable character, while his attainments are utterly unknown; and if a Japanese, as is often the case, is picked up at the very last moment, at very low wages, and his competence and trustworthiness are, to say the least, problematical. Under these conditions I have considered it my duty to attend in person to the proper vaccination of all on board, or about to take passage by, any ship where danger presumably exists. Should such a ship carry passengers for Hawaii, the sanitary inspector for Hawaii vaccinates these also, and I am thoroughly satisfied that both his method and the virus he uses are to be depended upon; in fact, we operate in the same manner and, as a rule, with vaccine identical in origin. In the operation of vaccination I have for some years made use of a device which, so far as I know, is original with myself, and which consists essentially of a modification of the syringe of Pravaz, having a short, spade-shaped point, and which can be used by one hand, delivering just beneath the epidermis a minute drop of virus at each fractional turn of the screw piston. I shall shortly send to the Bureau a description and drawing of this very useful instrument, with which I have several times vaccinated more than 300 persons in one hour, with the assistance of 2 men to disinfect the arms, making three punctures each.

No case of spirillum fever has been reported during the year, and but a few sporadic instances of the eruptive typhus have appeared in any portion of the Empire. I believe typhus to be, in fact, a disease of somewhat rare occurrence in this country. In an experience of nearly thirty years in Japan, although I have met with, altogether, some half dozen cases of typhus of sporadic nature, I have known of but one epidemic of serious character, which I investigated for the Imperial Government in 1890. This, however, though of brief duration, and presenting some abnormal and puzzling features, was of intense malignancy, recalling the awful outbreaks of jail or ship fever, which with us have now become of an interest chiefly historical. The disease appeared suddenly in a small and geographically isolated district some 20 miles from Yokohama, and occupied

by poor agriculturists and fishermen; and in the space of ten or twelve days literally destroyed nearly every person under the age of 30 years. Then, perhaps as a result of the very energetic measures of sanitation employed by the authorities, it ceased as suddenly as it began, not spreading, even in a single instance, beyond the territory in which it originated and ran its course.

Of measles, which, at irregular intervals, is extensively epidemic, although as a rule of nonmalignant type, no important outbreak has occurred in this country during the period dealt with in this report.

Scarlet fever, though sporadic cases, almost invariably of the mildest character, are met with at times, has never been epidemic in any part of Japan within my knowledge, and is after all so very rare that it may be practically left out of the consideration of the sanitarian.

I should be most glad were it possible to give the exact statistics of the year for the infectious quarantinable diseases to which I have thought it proper to confine this return. I am unable to do so, first, because the annual report of the sanitary bureau for 1898 is not yet compiled; and, secondly, because the current statistics of disease, formerly promptly and regularly published, are no longer either continuously issued nor complete, so that I am unable to prepare from these an estimate that would be even approximately correct. As you are aware I have for some years furnished by nearly every mail, especially during the progress of any epidemic, statistical returns derived from the reports of the home department, and as complete as possible under the circumstances. These I shall continue if the needful material remains available, and defective in some respects as they will undoubtedly prove to be, they will at least afford a general idea of the existing sanitary situation.

The facts that nearly all the travel through and from Yokohama is by steamers touching here en route from China, and remaining in this port but a few hours; that there is no depot for passengers, and that the latter, when coming as they do in large numbers by rail, often arrive here very shortly before the departure of the vessel by which they go, necessarily modify the methods of inspection employed. Except when epidemic infectious disease is present in the city of Yokohama or its neighborhood, or in remoter districts from which passengers are known to have come, in which case the law as to anteembarkation quarantine, disinfection, and vaccination is complied with as strictly and minutely as circumstances and want of appliances permit, the method of inspection is as follows, taking the term inspection in the broadest sense:

Upon application being made for bill of health, generally the day before the sailing of the ship, the captain or agent presents any United States bills of health already received on the voyage, and an appointment is made for inspection as nearly as possible to the hour of sailing, allowing sufficient time for the actual performance of the requisite examination, generally from two to three hours.

Should infectious disease have occurred between the port of departure and this point, the surgeon, or if there is none on board the captain, is called on for a report of the same, detailing all facts of interest in the case, as well as relating the precautions taken either by the officers of the ship itself or by the quarantine authorities of any port visited. Should any sickness of suspicious nature exist on board at arrival in Yokohama, this also is reported, and I immediately visit the vessel, irrespective of the fact that she has successfully passed the Japanese inspector of quarantine, afterwards acting according to circumstances.

Shortly before visiting the ship for the final inspection I receive, with the necessary inspection cards, a full report of the passengers on board or embarking here, with note of changes in the crew, upon the following form, this giving me the information for filling the bill of health, usually in such cases supplemental:

*Report of passengers per S. S. ———, for ———, United States of America, via
———, leaving ———, 189—.*

	Cabin.	E. steer.	N. steer.	Total.
From Hongkong:				
For:				
From Amoy:				
For:				
From Shanghai:				
For:				
From Nagasaki:				
For:				
From Kobe:				
For:				
From Yokohama:				
For:				
Grand total				

Passengers landed Yokohama.....
 Sanitary condition of same.....
 Crew taken on Yokohama.....
 Sanitary condition of same.....
 Crew disembarked Yokohama.....
 Sanitary condition of same.....
 (If passengers or crew are disembarked for sickness, state disease.)

STUART ELDRIDGE, M. D.,
Sanitary Inspector for United States.

Taking an ordinary liner as an example, and *ceteris paribus*, the process is the same in other cases, the following are the proceedings upon my arrival on board: For the convenience of the ship the crew and officers are first mustered so that they may speedily return to their work, which is always most exacting just prior to sailing. A note of the numbers in the different departments is meanwhile furnished by the purser or other responsible officer. All officers undergo inspection with the crew, and if the ship has been in a port infected by plague within fourteen days, to inspection of the crew is added a thorough palpation of the neck, axillae, groins, and region of the thigh, immediately below the latter: the tongue, facial expression, and general condition being meanwhile studied. Any person affording the slightest basis for suspicion is placed under watch, and as soon as possible thereafter thoroughly examined by all the usual methods in a convenient place.

All steerage or second-class passengers from China ports are examined in an exactly similar manner, but the people embarking here are simply inspected, unless in individual instances of suspected disease. Where a physical examination is made all women are taken into a private place for the purpose. A strictly, checked by mechanical apparatus, is kept during the entire inspection by two persons, one of them in my employ, and should the totals differ or fail to agree with the reported numbers, renewed count is made until, beyond question, every individual has passed through my hands. The quarters are inspected while emptied of their occupants, not only as to their sanitary condition, but for the detection of any truants from inspection, or any stowaways, sick or well. The baggage taken on at Yokohama is also inspected, passed, and labeled.

Crew and passengers are interrogated as to the quantity and quality of food and water supplied, and should there be any complaint an examination of these necessities is made.

A general survey of the ship follows, including closets, storerooms, galleys, etc., and, everything being found satisfactory, the bills of health from other ports which have until now remained in my custody, are, with supplemental ones issued by me, delivered to the ship, which is then free to pursue her voyage.

Should any matter of sanitary importance appear either in the history of the ship before her arrival in Yokohama, occur during her stay in port, or be detected during inspection, it has been my invariable rule to communicate it directly to the United States quarantine officer at the port of destination, attaching the letter to the bills of health in order to insure its prompt delivery.

As you know, until an arrangement was effected providing for the disinfection of vessels, with their crews and passengers, by the quarantine officers of the Japanese Government, upon my request, and which has now been applied to the other open ports as well as Yokohama, the authorities at these acting upon the requisition of the United States consul, all my attempts at compliance with the law applying to infected vessels were made under a heavy handicap, owing to the absence of any appliances for disinfection under my control. I beg to call your attention to the fact that the arrangement with the Imperial Government applying only to ships per se should ante-embarkation quarantine, or disinfection of passengers and baggage at any time become necessary, and it is most probable that such emergency will occur, the deficiency of apparatus and the absence of any place whatever in which to enforce isolation, will render any satisfactory application of the quarantine regulations in these respects impossible. Steerage travel from Japan is now so large that the combined companies concerned can well afford to supply the necessary conveniences for due enforcement of the law, and I would suggest that pressure be brought upon them to compel them to do so.

I take this opportunity of expressing my appreciation of the hearty support and assistance I received from our minister at Tokyo, Mr. Albert E. Buck, in bringing before the Imperial Government the request of the Bureau that the native quarantine officials should undertake the disinfection of vessels, when such is required, and of the prompt, courteous, and favorable action of the Japanese ministers in regard to the matter.

The system of disinfection of vessels and their personnel employed at the quarantine stations of Japan, as described below, is in the case of the graver infectious diseases, against which no reliable prophylaxis as yet exists, such as cholera and plague, carried out with great thoroughness. As the Japanese have comparatively little fear of variola, depending upon isolation and enforcement of vaccination for its control, there is, perhaps, some tendency to a relaxation of the strictness of quarantine methods in the treatment of this disease, as evinced in the case of the steamship *Belgic*, to which I shall recur later.

Upon the arrival of an infected ship at the quarantine station, all on board, save a detail sufficient to insure the safety of the vessel, are immediately taken on shore, the sick entering the hospital and the well going to the disinfection buildings, where they are given a warm bath, sometimes containing an antiseptic, and on emerging receive comfortable aseptic robes, to be worn until the disinfection of their clothing by high-pressure steam, which is begun during the bathing process, is completed. Meanwhile all personal baggage and bedding is taken on shore and is disinfected under rules precisely similar to those enforced at the quarantine stations of the United States. At the same time such portions of the ship as can by any possibility have been exposed to infection are disinfected by the removal and destruction of all dirt and rubbish, and by washing with 1: 1,000 solution of bichloride or a strong preparation of carbolic acid, generally the latter. Carbolic acid is at the same time freely sprayed about from large hand atomizers.

As soon as possible the ship keepers are relieved and in their turn bathed and disinfected.

Upon the completion of the purification of the vessel the disinfected crew and

passengers are returned to the same and remain to undergo such detention as is prescribed; in the case of cholera five full days, in that of plague seven full days, reckoning from the completion of disinfection.

There is some complaint of deficiencies in the facilities for rapid handling of men and effects, especially as regards an insufficient equipment of launches and barges for transportation between ship and shore, and for these complaints there is, I think, justification.

It is, however, in the treatment of the ship itself that the processes employed most demand improvement. At present the methods are neither thorough nor modern, nor can they be considered as effective.

The authorities are alive to the defects of their administration in this respect, and want of appropriations, which has hampered sanitarians in other lands, is alone responsible for the absence of tugs properly equipped with powerful disinfecting apparatus. It is hoped that the deficiency in this direction will soon be supplied.

Fortunately, during that portion of the year covered by this report, which antedated the arrangement with the Japanese Government, to which I have already referred, no vessel bound for the United States required disinfection. The first ship treated under the new system was the Occidental and Oriental steamship *Belgie*, upon which a case of semiconfluent smallpox developed in a steerage passenger during the voyage from Kobe to Yokohama, where she arrived October 21, 1898. As I reported at the time, the process employed in disinfecting this ship was not altogether satisfactory, in that for some reason unknown the crew were omitted from the treatment to which the passengers were subjected. All hands on board were vaccinated by the ship's surgeon with virus of approved quality. A second case of smallpox appeared in the steerage during the subsequent voyage of the *Belgie* from Yokohama to Honolulu, but as it developed within eleven days of the removal of the first case from the vessel, it can only be considered as a case of direct infection and no evidence of want of efficiency in the process of disinfection employed, however incomplete.

The British steamship *Monmouthshire*, from Hongkong to Portland, Oreg., via ports, had among her Chinese while in Kobe a case of smallpox. The ship was disinfectd at the Kobe quarantine station, and all on board vaccinated by a physician connected with the United States consulate there, and on the departure of the ship from this port, March 4, 1899, I vaccinated all passengers embarking here.

Upon the steamship *Columbia*, from Hongkong to Tacoma, via ports, a case of variola was detected among the Chinese steerage passengers, April 18, 1899, a few hours before her arrival at Moji, a coaling port in southern Japan, at which there is no regular quarantine station, nor is there any consul or other United States official. The patient was landed by the Japanese police, who performed a perfunctory disinfection by sprinkling the steerage with weak carbolic acid. The surgeon of the ship, who was at the time almost moribund from pulmonary hemorrhage, followed this by fumigating the steerage, steerage baggage, and the room in which the patient had been isolated, with sulphur for two hours only, the compartments being then washed with chloride of lime and finally white-washed. All hands on board, with the exception of the firemen, were vaccinated by the ship's surgeon, and the passengers taken on later at Kobe were submitted to the same operation before embarkation. Upon the arrival of the ship at this port, April 26, I vaccinated the firemen as well as all passengers taken on board here.

On the voyage of Occidental and Oriental steamship *Gaelic*, from Hongkong to Shanghai, en route for San Francisco, a very malignant case of plague occurred under the following circumstances, and precautionary measures were taken as detailed below. April 17, 1899, the case was detected by the surgeon of the ship

and was immediately isolated, the patient dying the same evening; all bedding and clothing were destroyed and the body thrown overboard. On the morning of the 18th the ship arrived at Woosung, just below Shanghai, where the local health officer fumigated the steerage with sulphur, destroyed all matting in the compartment, and washed the sacking bottoms of the bunks with chloride of lime. The ship left Woosung April 19, arrived at the quarantine station of Nagasaki at daylight on the 21st, and was immediately placed in quarantine, where the usual process of disinfection was carried out, the baths in this case containing bichloride of mercury. The ship was detained until noon of the 29th, or for seven full days after the completion of disinfection.

May 26, upon the departure of Japanese steamship *Nippon Maru*, from Nagasaki, on her voyage from Hongkong to San Francisco, the sudden death of a young Chinese steerage passenger was reported. Investigation seemed to show that the fatal attack was, at the most, of an hour's duration, as the surgeon of the ship had seen the deceased, in apparent health, but two hours prior to death. No unusual or suspicious appearance was detected on the body by the medical officer of the vessel, the condition of the glands being especially examined. The friends of the deceased gave a history of preceding attacks of a nature suggesting cardiac disease. To be on the safe side the ship was immediately headed for the quarantine station, and, upon arrival there, the quarantine physicians removed from each axilla of the deceased a gland, from the examination of which they, on the following morning, rendered a diagnosis of plague. The body was cremated and disinfection of ship, crew, passengers, and baggage made in the regulation manner. Disinfection was completed at 10 p. m. May 27, and the ship released at 2 p. m. June 3.

This voyage of the *Nippon Maru* appears to have been a particularly unfortunate one, as between Yokohama and Honolulu a death occurred which, again on the basis of a bacteriological examination, was decided to be from plague; while, on arrival at San Francisco, the local health authorities thought that they found the bacillus pestis in the bodies of two passengers drowned in the bay.

Although, in the presence of so tremendous, imminent, and little understood a danger as plague, we can scarcely be too severe or minute in our precautions, I, knowing the uncertainty of purely bacteriological diagnosis in the hands of others than thoroughly trained experts, may be pardoned for some skepticism as to the actual infection of the *Nippon Maru*.

June 23, 1899, the Japanese steamship *America Maru*, from Hongkong to San Francisco, arrived here with a suspicious case on board which, though indefinitely ailing for several days, had, after some hesitation, been passed by the quarantine inspectors at Kobe, no specific symptoms being then evident. The patient was a Chinese member of the crew.

After a painstaking investigation by the quarantine officials of this port, the ship, with all on board, was sent to quarantine, the wisdom of this course being fully demonstrated on the following day by the development of unmistakable symptoms of plague, the corroboration of the diagnosis of this disease by the discovery of the specific bacillus, and, finally, the death of the patient the succeeding night. A Japanese sailor of the same ship was also isolated on the morning of the 24th as suspicious.

Through the courtesy of Dr. Hoshino, medical director of the Yokohama quarantine office, and a graduate of an American school of medicine, I was enabled to visit these patients in the quarantine hospital, doing so on the afternoon of the 24th, when I found the Chinese to be, in my opinion, suffering from bubonic plague, and that the Japanese was in all probability in the earlier stage of the same malady. Further observation verified the diagnosis in the case of the Japanese, though the man, fortunately, recovered.

At the time of my visit to the *America Maru* on the 24th, I found that the process of disinfection was nearly completed, and was able to satisfy myself of the thoroughness with which it is carried out. I made a second visit to this ship at a later date while she was still in detention.

Though, with the invariable exception of the defective purification of the ship itself, the disinfection of the *America Maru* seems to have been conscientiously performed, the ship was liberated from quarantine after a detention of but six days, instead of seven as required by Japanese law. This has since been explained to me as due to a miscalculation on the part of one of the officials, and the error is not likely to be repeated.

June 27, 1899, upon the arrival of the American steamship *City of Peking* at Nagasaki, a man suffering, apparently, from plague was found by the Japanese inspectors among the Chinese in the steerage. The ship was placed in quarantine and the patient taken ashore, where the diagnosis of plague was speedily confirmed by the development of decided symptoms and the detection of the bacillus. Death occurred on the morning of the 30th.

The usual disinfection was enforced, and the ship detained for seven full days from its completion.

I have already submitted to you detailed returns of the vessels inspected by me, with the numbers of their passengers and crews, for the six months July to December, 1898, and the half year January to June, 1899, and will here supply but a recapitulation of the same. I have kept no record of the amount of baggage inspected or disinfected, but we shall not be far wrong in estimating the baggage of the steerage class at two pieces for each individual.

During the fiscal year ended June 30, 1899, I inspected 159 vessels bound for ports in the United States and 6 destined for points in the Philippines or for Guam; total, 165.

Of these ships, 34 were under the United States flag, 97 were British, 22 Japanese, 5 German, 4 Hawaiian, 1 French, 1 Norwegian, and 1 Chinese.

Of the vessels inspected, 125 were steamers and 40 sailing ships, and of the steamers 86 carried steerage passengers, as follows:

In transit:

To United States	9,066	
Way	8,514	
		17,580

From Yokohama:

To United States	2,633	
Way	8,500	
		11,133

Total passengers inspected	28,713
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Crews of all vessels inspected	10,481
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Total persons inspected	39,194
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Pieces of baggage inspected (estimated)	22,260
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Pieces of baggage disinfected by Japanese quarantine officials (estimated) ..	2,840
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Vaccinations performed	375
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The clerical work of my office is by no means trifling. I have during the year written 193 formal official letters, and filled up 932 official forms of various kinds; a total of 1,125 documents executed.

I am, sir, very respectfully, your obedient servant,

STUART ELDRIDGE, M. D.,

Acting Assistant Surgeon, M. H. S., Sanitary Inspector, Yokohama.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

CHINA.

HONGKONG.

As a further precaution against plague, it was deemed advisable to detail a medical officer to serve in the office of the United States consul at Hongkong, China.

The correspondence and instructions follow:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
Washington, D. C., July 22, 1899.

SIR: On account of the increased prevalence of plague in Hongkong and the relation of that port to ports in the Philippine Islands occupied by our Army, and for the protection of the ports of Hawaii and the Pacific coast of the United States, it is deemed necessary to adopt additional measures for the prevention of the introduction of plague from Hongkong to the ports named.

I have therefore to request authority, under the provisions of section 2 of the act of Congress approved February 15, 1893, "granting additional powers and imposing additional duties upon the Marine-Hospital Service." to detail P. A. Surg. J. C. Perry, of this Service, for duty in the office of the United States consul at Hongkong.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

The SECRETARY OF THE TREASURY.

TREASURY DEPARTMENT,
Washington, August 17, 1899.

SIR: I have to invite your attention to a letter of the United States Marine-Hospital Service, addressed to this Department, stating that on account of the increased prevalence of plague in Hongkong and the relation of that port to ports in the Philippine Islands occupied by the Army, and for the protection of the ports of Hawaii and the Pacific coast of the United States, it was deemed necessary to adopt additional measures for the prevention of the introduction of plague from Hongkong to the ports named, and requesting authority to detail P. A. Surg. J. C. Perry, of the Marine-Hospital Service, for duty in the office of the United States consul at Hongkong, which request was approved by the President July 24, 1899.

I have now to request that the consul-general at Hongkong be notified by cable that Passed Assistant Surgeon Perry has been detailed by the President to serve in the office of the consul-general, and sign bills of health with him.

Respectfully, yours,

L. J. GAGE, *Secretary.*

The SECRETARY OF STATE.

DEPARTMENT OF STATE,
Washington, August 22, 1899.

SIR: I have the honor, by direction of the Secretary of State, to acknowledge the receipt of your letter of the 17th instant, stating that P. A. Surg. J. C. Perry, of the Marine-Hospital Service, has been detailed by the President to serve in the consulate-general of the United States at Hongkong, China, and to sign bills of health conjointly with the consul-general. A telegram to this effect has to-day

been sent to the consul-general, and he has been instructed to give Dr. Perry all necessary assistance.

I have the honor to be, sir, your obedient servant,

THOS. W. CRIDLER,
Third Assistant Secretary.

The SECRETARY OF THE TREASURY.

[Telegram.]

WASHINGTON, *July 29, 1899.*

P. A. Surg. J. C. PERRY,

Marine-Hospital Service, Port Townsend, Wash.:

Take *Empress* 31st for Hongkong. Transfer property to Gardner, subject to subsequent verification. You have been detailed by President to serve in office consul at Hongkong, who will be notified by cable from State Department. Cable recommendation concerning enforcement paragraph 5, page 16, regulations and article 9, plague amendment. Bureau can not determine advisability this enforcement at present, because nondetained and nondisinfected Chinese may seek entry via Canada to avoid these regulations. Not mandatory at present to enforce these provisions, but authorized, if necessary.

W. WYMAN,
Surgeon-General M. H. S.

[Telegram.]

WASHINGTON, *July 29, 1899.*

PERRY,

Marine-Hospital Service, Port Townsend, Wash.:

Your detail by order President is to protect Philippines as well as United States.

WALTER WYMAN,
Surgeon-General M. H. S.

[Cable.]

WASHINGTON, *August 29, 1899.*

PERRY,

United States Consulate, Hongkong:

Arrange Hawaiian inspector enforce regulations Chinese bound Honolulu.

WYMAN.

Frequent reports were received from Passed Assistant Surgeon Perry and printed in the Public Health Reports, 1899. Following is his complete report from date of arrival to November 1:

REPORT OF TRANSACTIONS AT HONGKONG, CHINA.

HONGKONG, *November 18, 1899.*

SIR: I have the honor to hereby submit the following report of the transactions of the Service at the port of Hongkong for the period extending from August 23, 1899, to November 1, 1899:

As directed by Bureau telegram of July 29, 1899, I sailed on the *Empress of India*, and arrived in Hongkong twenty-four days later. I assumed the duties of my office on August 23, and immediately began investigations relative to the means

available for detaining and disinfecting Chinese passengers, if it should be deemed advisable to enforce these regulations. Inquiry showed detention to be impracticable, as there are no buildings suitable for such a purpose, and besides, such a procedure would not be permitted under the colonial laws. As a number of cases of plague were still occurring, although the epidemic was diminishing, it was deemed necessary to require disinfection of all Chinese steerage passengers sailing for United States ports, in so far as it could be made effective. In this work difficulties were encountered, because only one steamship company, the Pacific Mail, had a disinfecting plant, and this could not be used for the disinfection of passengers sailing over the other lines of steamers, as the local manager had positive instructions not to allow its use for this purpose. It was also learned upon inquiry that formalin could not be purchased in quantities either in Hongkong or other Eastern cities, consequently disinfection of all passengers could not be effected; but at the date of writing negotiations are pending by which this plant will in all probability soon be available for disinfection of passengers carried by the other vessels. Another difficulty relative to disinfection was the fact that the lines of steamers sailing to Seattle and Tacoma, Wash., carry passengers for both British Columbia and United States ports, and the disinfection of those destined for the latter places would be rendered ineffective on account of their constant intermingling during the voyage with the nondisinfected Chinese for Canada.

The protection of the Philippines was an even more difficult problem than that of the United States, as there are seven companies dispatching vessels to Manila, and none of them have any means for disinfecting their passengers, and few ships even carry a surgeon. The distance from Hongkong is only seventy-two hours, and there is no plant for the disinfection of vessels and passengers at Manila. During the prevalence of plague here a quarantine of three days was imposed on vessels arriving at Philippine ports from Hongkong, but, so far as I have been able to ascertain, no baggage was disinfected.

There are two classes of vessels carrying Chinese passengers to the Philippines—one goes direct from Hongkong to Manila, the other by way of Amoy; consequently, to make disinfection of these passengers effective it must be instituted in Amoy as well as here, as by far the greater number sail from that city.

There is no quarantine station at Hongkong, in the modern sense, and no disinfecting plant for the treatment of infected ships. If a vessel arrives with contagious disease on board, the patients are removed to the infectious-disease hospital and disinfection of the vessel performed by the primitive method of burning sulphur in iron pots. There are no barracks for the isolation or detention of suspects. The United States Marine-Hospital Service, of course, has nothing, and the custom in vogue in boarding ships for inspection is to require the companies to provide a launch for the inspection of their vessels, except in the case of United States sailing ships, when a launch is hired and charged to the consulate expense fund.

As mentioned above, the steam disinfecting chamber is owned by the Pacific Mail Steamship Company. It was installed in 1896 for the disinfection of Chinese passengers going to the Hawaiian Islands, as that government made it compulsory for all Chinese from infected districts to be disinfected at port of departure. The chamber is modern in every particular and similar to those in use at the United States quarantine stations. It is 16 feet and 4 inches long, 4 feet and 3 inches wide, and 5 feet and 3 inches high, inside measurements, and is fitted with an ejector instead of a vacuum pump. It is located in the large and commodious godown of the company. In connection with the boiler is a hot-water heater for furnishing the baths.

A portion of the building is divided by partitions to provide a bath house. This has a concrete floor and is equipped with 18 tubs. The bath, which consists of a

solution of bichloride of mercury, 1:5,000, is given under the supervision of an attendant detailed for that purpose.

The method followed in disinfecting baggage and clothing and in bathing the crew and passengers is briefly as follows: On the day previous to the sailing of the ship the baggage is taken to the godown for disinfection, and is subjected to live steam for thirty minutes; the clothing, etc., is then retained in the chamber an additional ten minutes, subjected to dry heat, for the purpose of thoroughly drying them. There is ample space for operating the chamber from either end, and as two cars are provided, all the dirty clothing is put in at one end and the disinfected removed from the other, so that there is no risk of contaminating the clean articles. As soon as the trunks or boxes are empty they are wiped out with a bichloride solution, 1:1,000, then repacked with the disinfected clothing, labeled with the proper certificate, and immediately sent on board the ship. The baggage is disinfected before the bathing of the passengers is begun.

Only a limited number of those to take the bath are admitted to the building at one time, and precautions are taken to see that there is no association between those who have been bathed and the others. After the bath, clean clothes are provided, while those recently worn are being disinfected. When 50 or 60 have been bathed and have received their clothes, they are immediately sent on board ship direct from the godown, a small company launch being utilized for their transportation. This process is continued until the entire number have been bathed, and then the crew are brought on shore and given a bath in the same manner. Each person bathed (crew and steerage passengers) is given a yellow ticket, marked disinfected, and they are required to show them on inspection the following morning. The object is to prevent them from evading the disinfecting process, and if one can not produce this ticket on inspection he is sent on shore and not allowed to sail.

The inspection of all passengers is done on board the ships a few hours before they sail. All Asiatic steerage passengers and crew are carefully and individually examined, special attention being given to the cervical, axillary, inguinal, and femoral regions in order to detect any suspicious enlargement of the lymphatic glands. The body temperature is estimated by touch, and all those that apparently show an increase are placed on one side and rigidly examined, their temperature being taken with thermometer in mouth or axilla. All those who show an elevation of temperature above 37.4 C., any enlargement of lymphatic glands, or even look weak and ill, although there is absence of the above symptoms, are rejected. There is simple inspection of European passengers and white members of the crew.

Since my arrival all the crew and Asiatic steerage passengers sailing from Hongkong on the vessels going to San Francisco have been given a mercurial bath, and all their baggage and clothing have been disinfected with steam and bichloride of mercury solution. No disinfection of the passengers and crew of the vessels sailing to Seattle and Tacoma, Wash., and Portland, Oreg., could be done for the reasons stated herein.

The tabulated statements given below show the amount of work done during the period embraced by this report, and it has been thought advisable to present separate tables for the purpose of showing the large number of steerage passengers (Chinese) sailing from Hongkong for Philippine ports.

Vessels and persons inspected sailing for United States ports.

Vessels inspected	38
Crew	3,627
Cabin passengers	191
Steerage passengers	2,254
Total passengers inspected	2,327

Total persons inspected	4,832
Rejected	93
Bathed (crew and steerage passengers)	3,334
Pieces of baggage disinfected	2,395
Pieces of baggage inspected	228

Vessels and persons inspected sailing for Philippine ports.

Vessels inspected	61
Crew	2,761
Passengers	395
Steerage passengers	2,311
Total passengers inspected	2,706
Total persons inspected	5,467
Rejected	145
Pieces of baggage inspected	2,177

Grand total: Vessels inspected, 99; passengers inspected, 5,033; total number of persons inspected, 10,299.

There has been no disinfection of passengers going to the Philippines, because, in the first place, there were no means for it, and besides it could not be made effective on account of most of the ships going by way of Amoy, China, and taking passengers from there. I think my present negotiations, by which other companies will be allowed the use of the disinfecting plant here will be successful, and if so I deem it advisable to enforce disinfection of this class of steerage passengers, provided the process by formalin can be enforced at Amoy. In this connection I will state that the number of passengers sailing from Amoy for the Philippines is two and one-half times greater than the number from this port.

I have done no vaccination at Hongkong, because all the steerage passengers on the vessels going to the States are vaccinated by the ship's surgeon. None of the passengers going to Manila have been vaccinated on departure or en route, as there was no smallpox in Honkong, and this extra amount of work would have necessitated the services of an assistant.

I inclose herewith for your information the form used in reporting the weekly transactions of vessels inspected.

In concluding this report, I wish to express my appreciation of the courteous manner in which I was received by Consul-General Wildman, and for the assistance he has given me in supporting my suggestions relative to inspection and disinfection of ships.

Respectfully, yours,

J. C. PERRY,

Passed Assistant Surgeon, U. S. Marine-Hospital Service.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

TURKEY.

CONSTANTINOPLE.

Dr. Spiridion C. Zavitziano, United States sanitary commissioner, representing this Government on the international sanitary commission at Constantinople, a position which he has held for a number of years in the State Department, has regularly transmitted to the Bureau full reports upon the sanitary conditions in Constantinople and other ports and places in the Far East. During the period covered by this report more than sixty communications have been received from him transmitting information of great value, most of

which it would be difficult to obtain from other sources and some of which it would otherwise be impossible to obtain at all. These reports have been published weekly in the Public Health Reports.

INVESTIGATION OF DISINFECTION OF RAGS AT ALEXANDRIA AND OTHER PORTS
IN EGYPT.

By reason of the existence of bubonic plague in Alexandria, Egypt, and the known fact that rags gathered in Egypt are shipped indirectly to the United States, and are therefore a source of danger, Assistant Surgeon Heiser, on duty at Naples, was directed to visit the chief ports of Egypt, and report upon the efficiency of the disinfection of rags destined for the United States, as required by the United States quarantine regulations. The full scope of his inquiry is detailed in the following orders, and his report will be published in the ensuing annual report of the Service.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., October 23, 1899.

SIR: You are hereby directed to nominate a temporary acting assistant surgeon, at a salary not to exceed \$5 per day, to assume your duties during your absence, and you are further directed to proceed, as soon as practicable, to the ports of Alexandria and Cairo, Egypt, for the purpose of investigating the manner of collecting, disinfecting, baling, and shipping rags, directly or indirectly, to the United States.

There are inclosed herewith letters of introduction from the State Department, addressed to the United States vice-consul-general at Cairo, Egypt, and the United States consular agent at Alexandria, Egypt, which you will present to the officers mentioned in order to secure their assistance in pursuing your investigations. By mistake the State Department forwarded copies of these letters direct to the consular officers mentioned.

Your attention is called to Article VII of the "Quarantine regulations to be observed at foreign ports and at sea," particularly to paragraphs 3, 4, and 5 thereof, and you are directed to make a rigid examination of the methods in vogue at Alexandria, to see whether the disinfection carried out is effective.

The presence of bubonic plague in Alexandria makes this a matter of great importance at the present time, particularly as it has been stated that the clothing of those who die of epidemic diseases is sold to rag dealers and finds its ultimate destination in America.

The regulations prescribe disinfection of rags by boiling, by steam or by sulphur dioxide gas, but the latter method is almost universally employed, because of its cheapness. While the regulations prescribe six hours' exposure to the gas, this is on the supposition of the room being thoroughly tight; and in order to insure a 4 per cent strength per volume of gas there should be used 5 pounds of sulphur to every thousand cubic feet of space, particular attention being paid to the closing of all avenues of escape; such as cracks about doors and windows. Attention is called to the regulation allowance for leakage by increasing the amount of sulphur, and you should insist on definite increase above 5 pounds when you think it necessary. It is best to have a chimney, ventilator, or some outlet near the upper portion of the room, which is left open for a certain time after starting the sulphur fire, in order to determine whether or not the gas is being evolved. As soon as this is satisfactorily demonstrated the aperture should be tightly closed, and

the period of exposure should date from this moment, and not from the time of kindling the flame. When sulphur is burned in pots, which is the usual method with rag dealers, about 2 pounds of sulphur should be powdered and placed in the bottom of the pot; this is then saturated with alcohol or coal oil and kindled with a match. Upon the flame is then poured a quantity of roll sulphur, broken into pieces about the size of an ordinary hickory nut, and upon this should be gently laid the larger pieces of roll sulphur to make up the necessary quantity. Care should be taken not to pile the sulphur on the fire too rapidly, so as to extinguish the flame. After the doors are closed there is usually no opportunity for inspecting the flame to see whether it is burning or not, and in case of Alexandria rags no chances should be taken.

You will observe what methods are employed by the consul in determining the absolute period of exposure to the disinfectant, and whether the disinfecting chamber is under the personal supervision of a reliable man connected with the consulate. It is customary at some ports for the consular clerk to visit the disinfecting chamber when the rags are placed upon the racks; to lock the door with a padlock and place a consular seal over the keyhole. This is considered a very good method, although open to some objection.

The regulations prescribe that in spreading rags on racks for sulphur disinfection, the layers of rags shall not be more than 6 inches in depth, and this is a matter of considerable importance, as gas evolved from a pot of burning sulphur does not penetrate as would steam under pressure.

You will ascertain, so far as possible, where the rags shipped from Alexandria are gathered; whether they are mostly shipped directly to the United States or via London or some other European port. You will further ascertain whether rags are sent by land to some other port in Egypt for shipment to the United States, in order to avoid possible trouble by reason of Alexandria being known as an infected port.

You will also examine into the details of invoicing rags for the United States, with a view to advising the Bureau on the necessity of a new regulation forbidding said invoicing unless the rags have been disinfected. The consul at Alexandria was directed by cable several years ago to refuse invoice while the cholera prevailed. It is believed that rags for the United States are shipped to England for transshipment to the United States, and, of course, the vessel not being bound for the United States, would have no United States consular bill of health; but if the rags are ultimately for the United States an invoice is (probably) necessary.

There is sent you, under separate cover, a copy of the Surgeon-General's annual report for the fiscal year 1893, which contains a report made by Surgeon Irwin and Dr. Walter Kempster regarding the shipment of rags from European and other foreign ports to the United States.

You are requested to make careful notes of the facts mentioned in this report, and are advised to carry the volume with you on your tour of inspection.

You will not necessarily confine your report to the question of rags, but will report freely upon any matters pertaining to the public health, particularly regarding plague; and if it is necessary to visit other neighboring ports for the purpose of gathering the information mentioned, authority is hereby granted to extend your trip accordingly.

Respectfully,

WALTER WYMAN,
Surgeon-General, M. H. S.

Asst. Surg. VICTOR G. HEISER,
U. S. Marine-Hospital Service, Naples, Italy.

QUARANTINE AND IMMIGRATION INSPECTION AT NAPLES, ITALY.

Through correspondence between the State Department and the United States consul at Naples, Italy, it became apparent that the

services of a medical officer were necessary at the port of Naples. One was accordingly detailed, as will be seen by the following letters:

DEPARTMENT OF STATE,
Washington, February 1, 1899.

SIR: I have the honor, by direction of the Secretary of State, to transmit herewith for your consideration copy of a dispatch from our consul-general at Rome in regard to the inspection at Naples of emigrants bound for the United States.

Under the circumstances set forth in the dispatch, this Department is strongly of the opinion that provision should be made for an official inspector at Naples, and it is thought that \$100 a month would cover the necessary expenses. I should therefore be glad to be informed whether your Department can provide some one to perform the duties of inspector, in accordance with the consul-general's suggestion.

I have the honor to be, sir, your obedient servant,

THOS. W. CRIDLER,
Third Assistant Secretary.

THE SECRETARY OF THE TREASURY.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, February 3, 1899.

SIR: I have the honor to acknowledge your letter of the 1st instant, inclosing, for the consideration of this Department, copy of a dispatch from our consul-general at Rome in regard to the inspection at Naples of emigrants bound for the United States. Your recommendation, made in view of the statements contained in the said dispatch, will receive careful consideration, and, in a later communication, you will be informed of the action determined upon in relation to the appointment of an official inspector at Naples.

Respectfully, yours,

L. J. GAGE,
Secretary.

THE SECRETARY OF STATE.

EMBASSY OF THE UNITED STATES,
Rome, Italy, February 17, 1899.

SIR: I have the honor to acknowledge the receipt of your No. 344, of January 27, 1899, instructing me that competent orders have been given to the United States consul-general at Rome that the system of consular inspection of emigrants, as instituted at Naples, shall be extended to the ports of Palermo and Genoa. Your instruction arrives at a most opportune time. Only yesterday I received a long note from the foreign office on the subject, pressing me for a decision from my Government in this matter; so that I have been very glad to be able to-day to send word to the minister for foreign affairs that the wishes of the Italian Government have been met. I inclose a copy of the note from the foreign office referred to with the pamphlet which it mentioned, because it shows the importance which is attached to this decision in Italy; and also a copy of my reply of to-day.

I am, sir, your obedient servant,

WILLIAM F. DRAPER.

HON. JOHN HAY,
Secretary of State, Washington, D. C.

EMBASSY OF THE UNITED STATES AT ROME.

February 15, 1899.

MR. AMBASSADOR: In your note dated June 24, 1898, your excellency was pleased to inform me that the Government of the United States would consider the proposal of extending to the ports of Genoa and Palermo the system adopted in the port of Naples for the inspection of the baggage of emigrants going to the United States.

I have the honor to recall now your excellency's attention to the above-mentioned proposal, which would doubtless result not only in rendering more simple the service of inspection of the baggage and to protect better the hygienic condition of the ships, but also would conduce to the attainment of a highly charitable object, that of restricting the number of persons, who, embarking for the United States in conditions not in conformity with those prescribed by the American laws upon immigration, are afterwards liable to be sent back to the port of sailing.

It is obvious that were the visits made simultaneously and upon agreement by the Italian commission at the ports of Genoa and Palermo and by the local consul of the United States, or by a delegate of his, the opportunity would arise for an exchange of mutual observations concerning emigrants who may be sick or poor and unfit for work, or suspected of going to the United States under contract of work, and thus to prevent the departure and the subsequent inevitable sufferings of many who presumably would not be permitted to land in the ports of destination.

In view of this I do not deem it useless to forward to your excellency a copy of the bulletin of this ministry, of December, 1898, containing a report of Car. Egisto Rossi, who directs at the barge office in New York the bureau of information for Italian immigrants.

As your excellency will see from the pamphlet, it would be a benevolent action to reduce to the smallest number the number of those who are rejected, and to this would greatly conduce, I believe, the united action of the Italian commission and of the American consular authority at the port of sailing.

I beg you, therefore, to kindly take again into examination the proposal in question, and while I await an esteemed answer in the matter, I renew to you, Mr. Ambassador, the assurances of my highest consideration.

N. CANEVARO.

His Excellency General DRAPER,

Ambassador of the United States, Rome.

EMBASSY OF THE UNITED STATES AT ROME,

February 17, 1899.

YOUR EXCELLENCY: I have the honor to acknowledge the receipt of your note of the 15th instant, again calling my attention to the desirability of extending to the ports of Genoa and Palermo the system of immigrant inspection which is now in force at Naples. In reply, I beg leave to say that I have to-day received notice from my Government that instructions have been given, through the consul-general at Rome, to extend this inspection system in the manner suggested, and I am informed by the consul-general that such orders will be promptly issued to the United States consuls at Palermo and Genoa.

I avail myself of this opportunity to renew to your excellency the assurances of my high consideration.

WILLIAM F. DRAPER.

His Excellency Admiral CANEVARO,

Minister for Foreign Affairs, Rome.

DEPARTMENT OF STATE,

Washington, March 7, 1899.

SIR: Referring to my letter of February 1, recommending the appointment of a medical inspector at Naples, Italy, and to your reply of February 3, stating that the matter would receive careful consideration, I have the honor, by direction of the Secretary of State, to inclose a copy of a dispatch from the consul at Naples, in which the situation is fully described. The Department can not permit an officer connected with the consulate to receive compensation from the steamship company for the reason that the law forbids the charging of extra fees where the services are official and a fee is prescribed. It would also obviously be improper for the person whose duty it is to guard the interests of this country against any illegal action of a steamship company to be in the pay of that company. It is of the utmost importance, therefore, that a medical officer should be stationed at this port, and I would again urge the matter upon your consideration.

I have the honor to be, sir, your obedient servant,

ALVEY A. ADEE,
Second Assistant Secretary.

The SECRETARY OF THE TREASURY.

[Inclosure.]

CONSULATE OF THE UNITED STATES,

Naples, Italy, January 27, 1899.

SIR: In the matter of the Department's instructions under date of December 15, ultimo, in reference to emigrant inspections at this port, a copy of which was forwarded me by the consul-general January 12, I have the honor to report that if the orders therein contained are strictly adhered to very serious embarrassments to the consular business at this office would inevitably result.

The numbers, character, and conditions of emigrants leaving Naples for the United States are greater and entirely unlike those sailing from any other port.

Mr. St. Leger, the vice and deputy consul, was very recently designated by the consul-general to superintend this important work. He had filled the position under my predecessor, and his long experience has rendered him an expert in a knowledge of the emigrants' various dialects, their deceptive tricks, and peculiar physical and mental characteristics. That no one in Naples equals his capabilities for the work is universally conceded.

After a thorough examination of his work, frequently occupying two days for a ship, the consul-general fixed upon 60 lire as his fair and moderate compensation, and which all the shipping companies cheerfully conceded. The Department's order annuls this pay, which necessarily ends his most efficient and every way satisfactory services.

The suggestion is made that the consul or one of his clerks do this work. This could not be done without serious detriment to the office work. The ships are distant from the consulate and their days of sailing are days when there is an extra rush of invoices, delivery of passports, answering inquiries, and furnishing official and unofficial certifications, requiring the personal presence of consul and clerks. Their absence from the office on these days, of all others, would prove most vexatious to shippers and others and seriously damaging to the service.

The order would seem to have been issued under misapprehension of the peculiar and exceptional conditions existing at this port. The great majority of emigrants for the United States are of a grade totally unlike those embarking from Hamburg or any other port, and I therefore respectfully request a further consideration of the subject. I am also unable to see any way in which to properly comply with

the sanitary laws of the United States in issuing the customary bills of health if these much-needed inspections are to be rendered less thorough or inoperative.

I am, sir, your obedient servant,

A. H. BYINGTON, *United States Consul.*

Hon. DAVID J. HILL,

Assistant Secretary of State, Washington, D. C.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, May 6, 1899.

SIR: I have the honor to request the detail, under provisions of section 2 of "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," approved February 15, 1893, of Asst. Surg. Victor G. Heiser, of this Service, to serve in the office of the United States consul at Naples, Italy.

This detail is necessary owing to the largely increased emigration from the port of Naples to this country and the freedom of communication which prevails between Naples and Eastern ports where epidemic diseases, particularly plague, exist.

Correspondence has been had with the State Department concerning the necessity for such a detail, and reference is made particularly to letters from the honorable the Secretary of State, dated February 1 and March 7 of this year, urging the matter upon the attention of the Treasury Department.

The expense involved in carrying out this recommendation is chargeable to the appropriation for preventing the spread of epidemic diseases, and your approval and that of the President is requested.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

The SECRETARY OF THE TREASURY.

MAY 8, 1899.

Asst. Surg. VICTOR G. HEISER,

Immigration Depot, Barge Office, New York, N. Y.

(Through Surg. L. L. Williams.)

SIR: You are informed that you have been detailed, by direction of the President, for duty in the office of the United States consul at Naples, Italy, under provisions of section 2 of "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," approved February 15, 1893.

Upon being relieved on or about the 13th instant by Asst. Surg. John McMullen, you are directed to report in person at this Bureau for instructions preliminary to your departure for Naples.

Respectfully, yours,

W. WYMAN,
Surgeon-General M. H. S.

MAY 27, 1899.

SIR: Referring to Bureau letter of the 26th instant, directing you to proceed to Naples, Italy, for duty in the office of the consul, under the provisions of section 2 of the act of February 15, 1893, you are instructed that your guide in the performance of your duties under this act should be the Quarantine Regulations of the United States Treasury Department of April 26, 1894.

The portion of these regulations which specifically applies to the work for

which you have been detailed is embodied in the Quarantine Regulations to be observed at foreign ports and at sea, pages 12 to 23, inclusive, and more particularly in articles 1 to 5, inclusive.

With regard to the inspection of vessels, your attention is particularly called to article 2, paragraph 2, Subdivision B, in which it is stated that inspection is required of all vessels carrying steerage passengers, the scope of this inspection being stated in paragraphs 3 and 4. The requirements of article 3, with regard to the condition of the vessel prior to the reception of passengers should be carried out as far as possible. It is believed that the provisions of article 4 will furnish you with all necessary information in dealing with cargo.

Particular attention should be given to sanitary condition of passengers and crew, and while you should note, for the benefit of the immigration service, any physical infirmities or defects observed by yourself, it should be borne in mind that inasmuch as your detail is under the provisions of the quarantine law, and not under those of any immigration law, you have not the authority to positively preclude the embarkation of passengers unless they are suffering from a quarantinable disease.

With relation to the baggage of passengers in general, and of the steerage class in particular, the liability of certain organisms, notably those of the plague, to be kept alive in warm, dark, and dirty containers, should be borne well in mind, and any baggage, which may by any possibility have become infected, should be inspected and labeled in accordance with the regulations.

With regard to article 6, you are informed that your functions do not extend to this, except in so far as to authorize you to advise the masters and other officers of vessels as to such means as should be taken by them to prevent the occurrence or the spread of epidemic disease while at sea.

You will render a weekly report, embracing all matters of sanitary interest which may be within your reach. You are not expected to confine your reports to sanitary conditions in the city of Naples alone, but should inform the Bureau of any matters of sanitary interest which may come to your knowledge elsewhere.

Respectfully, yours,

WALTER WYMAN,

Surgeon-General Marine-Hospital Service.

Asst. Surg. VICTOR G. HEISER,

U. S. Marine-Hospital Service, New York, N. Y.

Assistant Surgeon Heiser's report of transactions from the date of his arrival at Naples until October 7, 1899, follows:

REPORT OF TRANSACTIONS AT NAPLES.

UNITED STATES MARINE-HOSPITAL SERVICE,

Naples, Italy, October 10, 1899.

SIR: I have the honor to report that this station was officially reopened July 1, 1899.

The office is situated in the United States consulate. The equipment consists only of such articles as are necessary to do the clerical work connected with the station.

There is stationed here one assistant surgeon, whose duty it is to issue the bills of health in conjunction with the consul, to make such inspection of emigrants and ships as are required by the United States Quarantine Laws and Regulations. There is also employed here one person in the capacity of clerk, whose duty it is to perform the clerical work connected with the station, act as interpreter, and to assist with the inspection of emigrants. Much time is also devoted to answering letters of inquiry relative to emigrant inspection, from the United States consuls

stationed at the various ports of the Mediterranean Sea, to advising such American tourists as apply about infected territory, and inspecting at their own request individual emigrants as to whether they have any physical infirmity which would prevent their landing in the United States. (Every emigrant is, however, made to understand that this inspection is nowise official and only the expression of an individual opinion.)

This station has also been made, headquarters, more or less, for all information concerning the public health of southern Europe. Every United States consul in Italy and all the principal ones on the Mediterranean have written that they will promptly furnish this station with information about any contagious or infectious disease which may make its appearance in their respective districts.

The baggage of all third-class passengers is inspected on the day of sailing. This inspection is done by employees of the steamship company under the direction of the United States medical officer. This inspection is carried on jointly with the Italian officials, the whole process taking place in the open air on the dock alongside of the steamer. If found satisfactory the proper label is attached and the baggage is allowed to remain on the dock until the owner thereof has been inspected and passed, when it is permitted to be taken aboard. Such baggage as has been ordered for disinfection is disinfected aboard the steamer which is to carry it, all steamers carrying emigrants from this port being provided with a steam disinfecting chamber.

The third-class passengers are inspected in a building which is the property of the Italian Government. This building is a large, well-lighted, well-ventilated, and substantial building, the capacity of which is more than ample to meet all requirements.

By special permission of the Italian Government the United States officials are permitted to make their inspection simultaneously with the Italian officials. The details of the inspection are as follows: The intending passengers are first placed in a line. They are then allowed to advance one at a time, passing first to the medical officer of the Marine-Hospital Service; they then pass to the ship's doctor; then to the doctor of the port, and, if found satisfactory up to this point, "the medical inspection card" is stamped by the clerk of the Marine-Hospital officer. After this they go before the police inspector, and if everything is satisfactory they take their baggage and go aboard.

All emigrant ships are thoroughly inspected before the emigrants embark. The air space in the steerages is estimated. The amount of the various disinfectants is noted. Sufficient vaccine material is insisted upon, so if the occasion should arise everyone aboard could be vaccinated, and all the requirements of the United States Quarantine Laws and Regulations are strictly enforced.

Respectfully, yours.

VICTOR G. HEISER,

Assistant Surgeon, Marine-Hospital Service.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

SPAIN AND PORTUGAL.

INSPECTION OF OPORTO, PORTUGAL.

Upon the outbreak of plague at Oporto, Portugal, in August, 1899, Surg. Fairfax Irwin, then on leave in Europe, was directed to proceed to that port, by way of Marseille and Lisbon, to report upon the conditions as he might find them in these cities. His orders and report follow. Special reports, written in Lisbon and Oporto, were

forwarded and published in the Public Health Reports, 1899, pages 1608 and 1653-1656.

[Cable.]

WASHINGTON, August 16, 1899.

IRWIN,

Forty-eight Rumines, Lausanne, Switzerland:

Proceed Marseille, Lisbon, Oporto. Report on plague with recommendations. Acknowledge.

WYMAN.

REPORT UPON THE PLAGUE IN OPORTO, PORTUGAL, AND CONDITIONS IN MARSEILLE AND BARCELONA.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.

Port of Boston, Mass., November 27, 1899.

SIR: I have the honor to make this report of my journey to Spain and Portugal for your information:

I went from Lausanne to Marseille, mainly to find out, if possible, whether there had been any cases of plague there or any report of suspicious cases. The consul was absent on leave, but I obtained all the information necessary, principally from the vice-consul, Mr. Fast, and one of the clerks of the office, Mr. Chambers. Mr. Chambers had been, in 1893, carefully instructed by myself and other officers in the method of inspection of ships and emigrants, and his opinion is really of some value. So far it appears that there have been no cases of plague in Marseille, although it is without doubt the most exposed of any of the Mediterranean ports unless, indeed, it be Toulon. The trade between these ports and the East is very great; and, in the case of Toulon, important, because of the fact that it is a great French naval station. With these points in view, I recommend the employment of a sanitary inspector or a medical officer of the Service at this station, whose duty it will be to inspect ships and emigrants going from Marseille, and keep a careful lookout for the possible appearance of a case of plague.

From Marseille I went to Barcelona, where plague had been already reported. The consul-general there, Mr. Lay, however, assured me that no cases of plague had appeared in that city, and I am satisfied from other investigations that this was a fact. A medical officer should undoubtedly be stationed here, as this is the largest port in Spain, and the commerce is far greater, perhaps, than all the other ports together.

From Barcelona I went to Madrid, where I received a letter from the minister of the interior, which secured me very courteous treatment at the Spanish frontier.

My next point was Lisbon, where arrangements were made to go to Oporto.

At Oporto I found the following state of affairs: A city presenting all the appearances of an epidemic, shops all closed, no business being transacted, and this as a result of a total of only about 60 cases of the plague. In hospital I found 10 cases and had an opportunity to examine them carefully. There were at this time present medical delegates from England, France, Italy, Germany, Russia, Norway, Sweden, and Spain. It seemed to me that the main point which I had to investigate was the question how the plague was brought to Oporto, and how it was propagated from person to person, and I regret to say that in neither case have I any positive information to give.

The first two cases of plague reported in Oporto occurred in the persons of two stevedores, or what are locally termed "gallegos," or Galician porters, which makes it highly probable that they were infected while handling cargoes. But it must be remembered that no cargoes come to Oporto direct from any of the known infected ports, but are all transshipped in English ports; for example, rice is

unpacked, cleaned, and repacked in new bags and placed in other vessels before going to Oporto.

Now, as to the method of infection, we have the following possibilities: Personal contact, infected cargo, rats, and it has been said bedbugs or other vermin. Here we may dispense with personal contact and also vermin, as ships to Oporto do not come up to wharves or docks, but are unloaded on lighters in the stream. It has appeared to me highly probable that the stevedores above mentioned were infected handling cargo, which, although it had been previously handled, was nevertheless infected, the stevedores in England having been fortunate enough to escape.

Outside of Oporto so far the only cases of plague reported in Europe are at English quarantines, and, as is well known, their method consists in the case of an infected ship of disinfection and detention of sick people only. I can not help thinking that it is possible that under this method cases of plague may escape notice in an English port and infect other people or cargoes which might be discovered only at some other port.

In brief, it seems to me that the only probable explanation of the plague at Oporto is that it was brought there via some English port. In view of these facts it seems to me highly important that a medical officer should be stationed at some of the ports of England—notably, London, Southampton, and Liverpool.

With reference to the handling of the epidemic at Oporto, I must express the opinion, in spite of the fact that some radical measures are used, that the method of handling the epidemic on the whole is inefficient. An attempt is being made to destroy every focus by burning, and I am informed in one or two instances that that has been omitted on account of the value of the buildings to be destroyed. The sanitary cordon around the city is inefficient, owing to the poverty of the soldiers and their inability to withstand the bribes offered them by the country people wishing to pass through. It is doubtful if this sanitary cordon now exists, as the people of Oporto were on the verge of revolution on account of the restrictions to trade and travel and the probability that a change of ministry would result in the withdrawal of the cordon. I think the Spanish quarantines are efficient, steam disinfection being used and very careful inspection of persons and luggage made.

Finally, it seems to me that some active measures will have to be taken in view of the steady progress of the disease under consideration. It is slowly proceeding westward, and so far all efforts to stamp it out have been futile, cases actually reappearing in Alexandria after an interval of three weeks, and in Oporto a chain of cases for many days not amounting in all to more than six or seven cases in a week. In all probability any other disease under such circumstances would have long ago been stamped out. It is to be remembered, too, that it has existed in Oporto so far only during the most unfavorable season, as its progress in hot weather, as is well known, is very slow, with liability of great expansion upon the approach of cold weather. So far it seems that wherever plague has secured a foothold it has remained for an indefinite period, and often very radical measures seem to have little influence upon its progress. In this disease of all others it appears that "prevention" is the watchword.

Respectfully, yours,

FAIRFAX IRWIN, *Surgeon, M. H. S.*

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

UNITED STATES CONSULS IN SPAIN AND PORTUGAL DIRECTED TO ISSUE
BILLS OF HEALTH TO VESSELS DEPARTING FOR CUBA AND PORTO
RICO.

The medical officers on duty in Cuba invited attention to the danger from plague in the case of vessels leaving Spain and Portugal for the

West Indies. The United States consuls in Spain and Portugal were directed by the State Department to issue bills of health to vessels leaving those ports for Cuba and Porto Rico, as will be seen by the following correspondence:

DEPARTMENT OF STATE,
Washington, September 1, 1899.

SIR: I have the honor, by direction of the Secretary of State, to acknowledge the receipt of your letter of the 23d ultimo, requesting that the consular officers in Spain and Portugal be directed to issue bills of health to vessels bound for Cuba in the same manner as to vessels bound for the United States.

The consular officers in the countries mentioned have to-day been instructed in accordance with your request. Their attention has also been called to this Department's circular of February 20, 1899, notifying them of the extension of the quarantine regulations to Cuba and Porto Rico, and they have been directed to comply strictly with that circular and those regulations.

I have the honor to be, sir, your obedient servant.

THOS. W. CRIDLER,
Third Assistant Secretary.

The SECRETARY OF THE TREASURY.

DETAILS OF OFFICERS TO UNITED STATES CONSULATES IN CADIZ AND BARCELONA, SPAIN.

As plague appeared to spread slowly in Portugal it was considered advisable in October to detail two medical officers to the chief ports of Spain—Cadiz and Barcelona. There is little immigration direct from Portugal to the United States.

The following letter is self-explanatory:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, October 30, 1899.

SIR: I have the honor to invite your attention to the prevalence of bubonic plague in Portugal, and to the danger of transmission of the same to the United States, Cuba, and Porto Rico through emigration from Spanish ports, there being little or no emigration direct from Portuguese ports.

There have been about 100 cases of plague in Alexandria, Egypt, since May 4, 1899. It has also been reported in Kolobovka, Astrakhan, and St. Petersburg, Russia. It has extended down the west coast of Africa, 200 cases being reported June 7 from Grand Bassam, French Ivory Coast Colony. A suspicious illness has appeared at Asuncion, Paraguay, which is now being investigated by a scientific commission, and a similar disease has been reported from Santos, Brazil. These facts show that the disease is steadily proceeding westward and the possibility of its importation to the United States. Oporto, Portugal, is considered to be the most important point to which attention must be directed at the present time. Portugal sustains close commercial relations and direct railroad communication with Spain and her ports.

Surg. H. R. Carter and P. A. Surg. M. J. Rosenau write from Habana, Cuba, directing attention to the particular danger of importing plague into Cuba from Spanish ports, and recommend the medical inspection of emigrants at Spanish ports of departure. Consul-General Lay, at Barcelona, Spain, in a report to the Hon. David J. Hill, Assistant Secretary of State, dated September 27, 1899, makes the same recommendation.

The chief ports in Spain where emigrants embark for the United States, Cuba, and Porto Rico are Barcelona and Cadiz, and it is considered advisable to detail commissioned officers of the Marine-Hospital Service in the offices of the consuls at those ports immediately, in accordance with the provisions of section 2 of the act granting additional powers to and imposing additional duties upon the Marine-Hospital Service, approved February 15, 1893.

The question of inspection at the minor ports will form the subject of a later communication based upon the reports of the officers detailed to Barcelona and Cadiz.

I have, therefore, to request authority to detail P. A. Surg. James A. Nydegger in the office of the United States consul at Cadiz and Asst. Surg. John F. Anderson in the office of the United States consul at Barcelona.

Respectfully,

WALTER WYMAN,
Supervising Surgeon-General M. H. S.

The SECRETARY OF THE TREASURY.

BREMEN, HAMBURG, ANTWERP, AND ROTTERDAM.

INSPECTION OF METHODS EMPLOYED IN THE INSPECTION OF EMIGRANTS AT BREMEN, HAMBURG, ANTWERP, AND ROTTERDAM.

In view of the progress made by the bubonic plague, it was deemed advisable in October to detail Surg. Eugene Wasdin, who was engaged at that time in bacteriological investigations in the Pasteur Institute at Paris, to make an inspection and report upon the methods employed in the inspection of emigrants to the United States at the principal emigration ports in Europe. His orders related also to the bills of health given to vessels at the same ports. Following is his report:

REPORT OF SURG. EUGENE WASDIN, INSPECTOR.

PARIS, FRANCE, *October 27, 1899.*

SIR: In compliance with your telegraphic order, received at noon of the 13th instant, directing me to proceed at once to Bremen, Hamburg, Antwerp, and Rotterdam, for the purpose of inspecting the methods employed at those ports in the medical inspection of emigrants to the United States, and in the issuance of bills of health, I have to report that I have visited the ports named, called upon our consular officials, and engaged their interest in a thorough inspection. In advance I must express my indebtedness to each official for much courtesy in furthering the object of my visit to his post.

The preparation made in these cities to combat the entrance of cholera in 1893 and its transmission to our country was of such permanent character that the various plants are still in admirable working order, and can be made practically perfect in a very short time. The regulations promulgated by our Bureau are only nominally in force at this time. There exists an apathy, due to seeming security from any invasion of infectious disease. On the whole, I was convinced that the medical inspections were conducted honestly in the interests of the United States, as well as efficiently by the examining surgeons, but I regret to say that the inspection of baggage is not satisfactorily done at any point. There exists a widely differing opinion at these ports as to the extent of inspection required at all times, and at only one did I find the disinfecting plant in use, and at this point I found a marked want of intelligent direction.

I have taken the opportunity to impress upon the consular officials the impor-

tance which I know you attach to the enforcement of the regulations at this time, in view of the possible invasion of bubonic plague, at the same time inviting their attention to the essential difference between that disease and cholera, for the prevention of the importation of which our present rules were mainly framed. For instance, the most vigorously enforced rule was that depriving the emigrant of his "homemade" black bread and sausage, and as this was done at each port, I called their attention to the fact that these articles of diet do not play so important a rôle in the transmission of this pest as they do in that of cholera, and that the most careful disinfection of hand baggage is much the more important. Also, I have called attention to the exercise of great care in the inspection of the ships before the embarkation of the passengers, explaining the position assumed by the recent French commission to Oporto, Portugal, that the bubonic plague is transmitted by means of the atmosphere, or also by the touching of the eyelids or nasal mucosa with fingers which may be contaminated, the final result being the colonization of the microbe in the lungs, the pneumonic type of the plague.

From my researches into the cause of yellow fever I can but consider the introduction of the germ by respiration the one sufficient explanation, and therefore I have suggested a more rigid inspection of hand and small trunk baggage, and its disinfection when from Russia (at this time). In detail, I give the result at each port:

BREMEN.

At Bremen, Consul Murphy and ex-Consul Lange gave me every facility. Since the larger number of Russian emigrants are carried from this port and Hamburg, they were given great attention. The disinfecting plant of the North German Lloyds Company is small, an oval cylinder, without attachment for exhausting the air. It was the only one I saw in use. The method of disinfection was correct, but the practice of placing bundle baggage upon the car without loosening it up was criticised. The inspection of baggage was most imperfectly done, and had as well not been done at all. Evidently this work had been delegated to ordinary employees of the company, and had degenerated into a search for black bread and other articles of diet, all of which were instantly confiscated.

The medical inspection of the emigrants, under the able supervision of Dr. E. Peltzer, who receives his compensation through the consulate, is all that can be desired. Vaccination is done at this inspection, and since it entails the retention of the individual in the hands of the physician for several minutes, with chest and arm bare, it must be considered more advisable that this operation be done at the time of inspection than on board ship after sailing. The rule here has been that the consul attends these inspections personally. The inspecting physician is also in the employ of the German Government, and has control of the sanitation of all emigrants' boarding houses, which he is required to visit periodically. This portion of the work is in admirable hands.

As to the inspection of the ship and granting bills of health, I am under the impression that this is done in a very formal manner. Since most of the ships sail from Bremerhaven, the local consular officer attends to this duty, the signatures being given in Bremen. Unfortunately the present consul, Mr. Murphy, is only temporarily here, but I trust will remain sufficiently long to carry out several improvements contemplated before my visit. He courteously asked for suggestions, and is fully alive to the necessities of his port. The ship inspected here was the *Lahn*, sailing for New York.

HAMBURG.

At Hamburg I inspected the very admirable system of receiving barracks, with its disinfecting apparatus, under the supervision of Dr. Hohmann, an appointee of the German Government. At these barracks all emigrants are received who

pass the German frontier through any of the eight inspection stations, or who may finally be brought to that at Ruhleben, near Berlin, and are bathed, inspected, their baggage and clothes disinfected, and they are then lodged in clean barracks until the time of their departure. While the buildings are poor, and may soon be renewed, they are sufficient, and I believe the system is the most admirable of any. I witnessed the inspection of a large number of Russian Jewish emigrants, especial attention being shown to the inspection of the axillary and inguinal gland region, and believe there is nothing to be desired. I am informed that greater attention is paid here to the inspection of baggage, and there is frequent disinfection of hand baggage. Besides these barrack inspections there is a final inspection just prior to embarkation, at which our consular representative is present and at which he stamps the certificates. Also at this time all baggage is again inspected by a consular representative and the labels attached; any suspicious or extremely foul baggage can now, also, be disinfected under his supervision, there being an efficient chamber at hand. The ship inspection seems to be well done by our consular agent and the bills of health issued under more exact information as to the ship's actual condition than at Bremen. I witnessed the inspection of the *Augusta Victoria*, accompanied by Dr. Pitcairn, our consul.

ROTTERDAM.

At Rotterdam I inspected the hotel barracks and disinfecting facilities, accompanied by our consul and several gentlemen from the Holland American Company. These barracks are clean and under good supervision, but are inferior in point of safety to us to the arrangements at Hamburg. The inspection of baggage is too formal. I did not witness an inspection here, but am convinced that great care is exercised in all departments of this company's affairs. The bills of health are given after careful inspection of the ship by the consular attendant.

ANTWERP.

At Antwerp I inspected the very efficient plant of the Red Star Line, at their dock. The company has no barracks for passengers, but regularly inspects the boarding houses. At the time of embarkation they are collected for inspection at the disinfecting shed erected in 1893, where first the baggage is inspected, only nominally, and the individual then comes under the medical inspectors, one for the company, one for the Belgian State. This was very efficiently done and seemed to be the routine here. The disinfecting plant is extremely cumbersome, and I doubt its efficiency: however, it has had no steam introduced since 1893. At this medical inspection and sailing of the ship *Switzerland* I saw no representative of our consulate, save Dr. Frese, who is under the company's jurisdiction. The bills of health were issued on the preceding day. I do not know if there was any inspection of the ship. I am indebted to Mr. Strasser, general passenger agent of the line, for every opportunity to inspect the arrangements under his supervision.

Finally, you will permit me to summarize my impressions.

First. There should be a greater interest demanded in the inspection of individuals for apparent symptoms of plague; each should be exposed, just prior to embarkation, as to the inguinal and axillary regions.

Second. Vaccination at this time seems preferable because of the personal attention given by the physicians to each case. This is against the convenience of the company, but in the interest of health.

Third. The inspection of baggage should be done by the medical inspector or a medical attendant, to conform with his inspection certificate. It is too important a matter to be left to ordinary attendants.

Fourth. The disinfection of steerage baggage should be done, when necessary,

according to the most modern formula for such process, and to this end the apparatus should conform to the most modern demands.

All of which I respectfully submit.

Your obedient servant,

EUGENE WASDIN,
Surgeon, Marine-Hospital Service.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

IRREGULARITIES IN CONSULAR BILLS OF HEALTH.

During the year a number of reports were received from quarantine officers concerning irregularities in bills of health brought by vessels from certain foreign ports. The matter having been brought to the attention of the State Department, was promptly remedied, as will be seen by the following letter and inclosure:

DEPARTMENT OF STATE,
Washington, October 17, 1899.

SIR: Referring to your letter of the 11th ultimo, in regard to the irregularities at certain consular offices in the matter of issuing bills of health, I now have the honor to inform you that the officers mentioned in your letter have been suitably instructed, and a circular instruction on the subject has been issued to all consular officers. A copy of the circular is inclosed herewith for your information.

I have the honor to be, sir, your obedient servant,

JOHN HAY.

The SECRETARY OF THE TREASURY.

[Inclosure.—Circular.]

BILLS OF HEALTH.

DEPARTMENT OF STATE,
Washington, October 17, 1899.

To the Consular Officers of the United States;

GENTLEMEN: At the request of the Secretary of the Treasury, communicated to this Department in a letter of the 11th of September last, your attention is invited to paragraphs 375 to 378, inclusive, of the Consular Regulations in regard to issuing bills of health. Under the act of February 15, 1893, a vessel clearing from a foreign port for a port in the United States should procure from the consul of the United States at such port an original bill of health in duplicate, and subsequently at each port touched en route to the United States a supplemental bill of health in duplicate. The original bill of health is in all cases to be procured from the port of original clearance for the United States. Sickness occurring on board a vessel while en route from the port at which the original bill of health was issued should be noted upon the bill of health as having so occurred on board the vessel, and not as sickness in the port touched by the vessel.

Forms of bills of health (Form No. 1931a) and of supplemental bills of health (Form No. 1931½a) may be obtained at the Department upon requisition therefor.

Copies of the quarantine laws and regulations are or should be on file in the various consular offices, and the greatest care should be taken to faithfully execute their provisions.

I am, gentlemen, your obedient servant.

ALVEY A. ADEE,
Second Assistant Secretary.

UNITED STATES ARMY TRANSPORT SERVICE

As stated in the annual report for 1898, pp. 693-695, in July of 1898 a request was received from the Secretary of War for the detail of officers of the Marine-Hospital Service at Cuban and Porto Rican ports to carry out quarantine regulations, and also upon the army transport vessels, all with a view to expediting the movements of transports and to minimize the danger of their infection, and an order to this effect was issued by the Adjutant-General of the Army August 11, 1898.

The reports of several of these officers of special voyages were published in the last annual report, as were also the instructions which were issued to them.

The details were carefully made of officers who either had had experience in the boarding and cleaning of vessels at quarantine stations, or had special knowledge of yellow fever and other tropical diseases, and before being assigned to duty on the transports several who were familiar with tropical diseases but not with ship inspection were given a preliminary training at one of the United States quarantine stations. Eleven officers in all were thus detailed, namely: P. A. Surg. A. R. Thomas, Asst. Surg. S. R. Tabb, Asst. Surg. John McMullen, Asst. Surg. S. B. Grubbs, Asst. Surg. H. B. Parker, Asst. Surg. L. L. Lumsden, Asst. Surg. L. D. Fricks, Acting Asst. Surg. T. D. McClintie, Acting Asst. Surg. Spencer Hough, Acting Asst. Surg. E. F. McConnell, Acting Asst. Surg. Maxime Landry.

Despite the fact that the relation of the medical officer of the transport both with the commanding officer of the troops on board and with the quartermaster who was in command of the vessel was in some instances not definitely understood, nevertheless, the services rendered by the intelligent, active, and tactful efforts of these officers were highly effective and caused many commendatory expressions on the part of officers of the War Department, including the Quartermaster-General of the Army and the Acting Secretary of War. Their services were continued during a period of about nine months, namely, from August, 1898, to April, 1899, inclusive.

By May 15, 1899, the quarantine service in Cuba and Porto Rico having been established and the special necessity for Marine-Hospital Service officers on army transports no longer existing, they were withdrawn and replaced by officers of the Army.

Following is the correspondence relating to this order :

CORRESPONDENCE RELATING TO TRANSFER OF MEDICAL TRANSPORT SERVICE TO WAR DEPARTMENT.

WAR DEPARTMENT, *Washington, March 17, 1899.*

SIR: Under date of the 23d ultimo the Supervising Surgeon-General of the Marine-Hospital Service, your Department, addressed the medical superintendent of the army-transport service, New York, N. Y., as follows:

"I have to inform you that in accordance with request from the office of the

Quartermaster-General, United States Army, Acting Asst. Surg. E. F. McConnell has been assigned to duty as medical officer on the U. S. transport *Michigan*, and directed to report to Capt. Charles T. Baker, quartermaster on board, at Key West, Fla."

On the following day the medical superintendent of the army-transport service at New York forwarded a copy of the above communication to the Quartermaster-General of the Army, with request for instructions as to whether the services of marine-hospital surgeons should be continued on transports.

The Quartermaster-General thereupon referred the matter to the Surgeon-General of the Army, who, under date of 9th instant, reported as follows:

"As the transport service is now fully organized and its medical affairs under a medical superintendent, a medical officer of the Army, it is believed to be best that the transport surgeons should also belong to this Department in order that they may be fully under its control as to reports, property responsibility, etc.

"The aid heretofore extended by the Marine-Hospital Service is highly appreciated, but seems no longer necessary. It is recommended that its medical officers be replaced as soon as practicable by the medical superintendent.

"Request will be made upon the Supervising Surgeon-General, Marine-Hospital Service, to supply the Medical Department with copies of quarantine regulations and instructions necessary for the guidance of the transport surgeons."

The foregoing recommendations of the Surgeon-General of the Army have been approved, and in connection therewith the Department wishes to express its appreciation of and thanks for the very able and efficient services rendered by the surgeons of the Marine-Hospital Service on army-transport ships.

Very respectfully,

G. D. MEIKLEJOHN,
Acting Secretary of War.

The SECRETARY OF THE TREASURY.

TREASURY DEPARTMENT, *Washington, March 22, 1899.*

SIR: I have to acknowledge receipt of your letter of the 17th instant, relating to the service of Marine-Hospital surgeons upon transports of the War Department.

In reply, I have to state that I am informed by the Surgeon-General of the Marine-Hospital Service that he has already arrived at an understanding with the Surgeon-General of the United States Army, in accordance with which, by mutual understanding, the officers of the Marine-Hospital Service are to be detached from time to time. In accordance with the understanding these officers will be relieved as soon as the quarantine arrangements in Cuba and Porto Rico are perfected, and I am informed that the said quarantine arrangements are very nearly completed.

Respectfully, yours,

L. J. GAGE, *Secretary.*

The SECRETARY OF WAR.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., May 1, 1899.

SIR: In accordance with the request contained in your letter of March 9, 1899, this Bureau desires to relieve its officers who are now serving as medical officers in the transport service, and requests that you will arrange to relieve them by officers of your Department as the transports arrive in the United States.

The following is a list of medical officers of the Marine-Hospital Service at present serving on transports and the vessel on which each is serving:

Asst. Surg. John McMullen, transport *Buford*; Asst. Surg. L. D. Fricks, trans-

port *Sedgwick*; Acting Asst. Surg. T. B. McClintic, transport *McClellan*; Acting Asst. Surg. E. F. McConnell, transport *Kilpatrick*; Acting Asst. Surg. J. S. Hough, transport *Crook*.

Acting Asst. Surg. J. B. Yost, who served on the transport *McPherson*, resigned on April 30, 1899, and informs this Office that he has already made a contract with you to continue on duty as medical officer on that vessel.

In accordance with your request I transmit herewith a number of copies of the instructions issued to medical officers serving on transports as printed in the Public Health Reports.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

Surg. Gen. G. M. STERNBERG, U. S. A.,
Washington, D. C.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
Washington, May 2, 1899.

SIR: I have the honor to acknowledge receipt of your letter of May 1, and will give orders to replace the medical officers of the Marine-Hospital Service upon the transports mentioned by acting assistant surgeons of the Army at as early a date as may be practicable.

Very respectfully,

GEO. M. STERNBERG,
Surgeon-General U. S. A.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,
Washington, D. C.

REPORTS ON ARMY-TRANSPORT SERVICE BY OFFICERS OF THE MARINE-HOSPITAL SERVICE.

The following general reports are herewith published, which, in connection with the special reports previously published in the annual report for 1898, give a fair idea of the character of the service performed by the medical officers of the Marine-Hospital Service on army transports:

REPORT ON TRANSPORT SERVICE BY P. A. SURG. A. R. THOMAS.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
Reedy Island Quarantine, via Port Penn, Del., September 26, 1899.

SIR: I have the honor to make the following report of my services as sanitary inspector on board the U. S. transport *Obdam* from August 6, 1898, to January 15, 1899:

Under telegraphic orders I joined the *Obdam* at Newport News, Va., August 6, 1898, reporting to Brig. Gen. F. D. Grant, and Special Orders, No. 28, was issued assigning me to quarters and duty as sanitary inspector on the *Obdam*. There was at that time no one aboard the vessel to whom I could report, but a few days later a captain and quartermaster was assigned to her, and he was afterwards in charge of all matters aboard the boat except the navigation. I inspected the *Obdam* and found her mechanically clean. She had good cabin accommodations for about 100 persons, and could carry 400 to 500 troops comfortably on her berth deck, which was well lighted and ventilated. Hammocks in two tiers were hung 18 inches apart for sleeping. When more than this number was carried it was

necessary to utilize the orlop deck, which had no ventilation or light except such as came through the hatches, and I always advised against putting men there.

There was a distilling plant aboard, capable of supplying 2,500 gallons of aerated water daily. As a matter of economy, however, whenever good water could be obtained ashore it was used. The cold-storage plant was of the compressed-air pattern, and was old, but gave fairly good service. During the first two trips the *Obdam* carried coal as ballast, but later this was replaced by broken rock. This made good ballast, but as it was not covered, débris from the freight, particularly from hay and oats, would fall down between the stone. I recommended a tight board covering over this ballast, but the suggestion was not acted upon. The plumbing was old and poor and frequently out of order. It was promised to overhaul it several times, but this was never done. Temporary water-closets were built whenever a large number of troops were carried. There was no hospital, and the sick were either treated in their bunks or on cots put in the after companionway. During my tour of duty the *Obdam* made eight trips as follows: One from Newport News to Ponce, P. R., via Charleston, S. C., and thence to New York; three from New York to San Juan, Ponce, and Santiago, and back to New York; two from Savannah, Ga., to Habana, Cuba, and return; and one from Savannah to Matanzas. During these trips an aggregate of about 3,800 passengers were carried, and a crew of about 80 men was always aboard. I invariably treated all of the crew that became sick and much of the time the cabin passengers, and on several occasions I was the only medical officer aboard. Two hundred and sixty-seven cases were treated by me and received treatment three hundred and twenty-seven times. Eleven cases were sent to the hospital in the various ports. Two deaths occurred, one from heart failure in a convalescent and the other from tubercle of the lung. The latter was brought aboard moribund.

In order to keep the boat in a sanitary condition, an inspection of all parts of the vessel was made every morning, usually in company with the ship's officers, the quartermaster, and the officer in command. Any part of the vessel found in poor condition was at once reported to the proper authorities, and it was usually remedied. An effort was always made to have guards placed over the faucets to prevent waste of water, and over the lavatories. It was sometimes difficult to bring volunteer officers to see the necessity of this measure. The men's quarters were also policed, but occasionally very ineffectually, and this was the part of the vessel that it was hardest to keep clean.

In port the crew was forbidden to go ashore, and unless the vessel was at a dock, it was not difficult to keep them aboard. At the Porto Rican ports the passengers came and went at their pleasure, and it was impossible to prevent this. At Santiago an effort was made to limit shore communication, but it did not seem possible.

On reaching port, as soon as the local quarantine officer had visited the vessel, I called on the representative of the Service, if one was present, otherwise on the chief medical officer of the army at that point, and ascertained the health of the port. I then made such suggestions to the quartermaster as the case seemed to warrant. In several instances I requested that passengers in transit should not be allowed ashore at Santiago, and that only necessary officials should come aboard from shore, but these suggestions were disregarded. I inspected all passengers and baggage as they came aboard, and in several instances succeeded in having men rejected as not fit to travel on this vessel, and had them either sent to hospital or await a more suitable transport.

At only two ports did the *Obdam* go to dock—San Juan and Habana. At the former there was no particular objection, but at Habana she was at a badly infected dock. I recommended that she either lie in the open bay or put out from the dock every night, but this was not done.

In general, the condition aboard the boat was good. She was usually scrupu-

lously clean and well looked after. In port it was impossible to carry out full instructions from the lack of coöperation of those in command.

Respectfully, yours,

A. R. THOMAS,

Passed Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON TRANSPORT SERVICE BY ASST. SURG. L. L. LUMSDEN, U. S. M. H. S.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Seattle, Wash., May 23, 1899.

SIR: In obedience to your order of April 27, I have the honor to submit the following report of my recent work as sanitary inspector of the U. S. transport *Logan*:

I arrived at Savannah, Ga., on the morning of November 30, 1898, and, as directed by Bureau order of November 28, reported aboard the transport *Manitoba* (since changed to *Logan*) for duty as sanitary inspector of that vessel.

The *Manitoba* had then been in commission as an army transport for about eight months, and I ascertained that up to that time her sanitary history was good.

My first day aboard I made an inspection of the transport, and found her to be an iron vessel of about 5,000 tons gross; length, 447 feet; draft, 24 feet; average speed, 12 knots; stateroom accommodations for 50 passengers; and sufficient space on berth and orlop decks for comfortably quartering 1,100 men.

With the exception of some loose mechanical dirt gathered on the decks during the coaling and stowing of cargo, then going on, the vessel was apparently clean; and could several slight but much needed modifications have been made, she would have been admirably adapted for use as a transport.

Troops when aboard had quarters on the berth and orlop decks, which were divided into compartments by bulkheads and partitions. The berth and main decks were covered with a layer of cement about one inch in thickness, in which were fixed cleats that had been put in when the vessel was used as a cattle ship and were not yet removed. These cleats, running lengthwise with the vessel, divided the decks up into spaces of about 2 feet each, and laid across and nailed to the cleats at intervals of 8 feet were 12-inch boards, which supported the lower ends of the hammock stanchions. Thus numerous recesses were formed in which dirt could readily lodge and be very difficult to remove.

The orlop deck forward was covered over with flooring of broad boards, there being an objectionable space of one inch between the flooring and the deck.

Everything in these troop compartments, even the decks, had been deluged with whitewash, and presented a very white and clean appearance. Whitewashing of the decks, as could be anticipated, proved to be a mistake, as when this was mixed with water and dirt the combination formed a coating on the decks that was filthy, slippery, adhesive, and very difficult to remove, as subsequently demonstrated on the *Logan*.

The best deck for the troop compartments is the plain iron, which may be given a coat of paint, or, better still, asphaltum varnish.

All compartments below were well lighted by electricity aided by sunlight until the orlop deck was reached.

By means of open airports, windsails, open hatchways, ventilating shafts, four large steam fans on spar deck which forced fresh air through large pipes to compartments below, and a large Sturtevant blower on the berth deck which expelled vitiated air, an excellent system of ventilation was effected and well maintained

under the most crowded conditions that existed on the transport while I was aboard of her.

The water-closets for the troops, consisting of four troughs arranged on the main deck, two forward and two aft, presented many objectionable features. In the first place, the location was wrong, as they should have been placed over the stern of the vessel; in the second place, the flushing water was insufficient in both force and quantity, and consequently while troops were aboard it was necessary to station a guard at each one of the troughs to keep the waste holes from becoming clogged and the troughs overflowing; and in the third place, the waste holes opened directly out over the side of the vessel from the main deck, so that when lying at dock or alongside of another vessel the flush water had to be kept turned off, with the troughs sometimes remaining half filled with excreta.

The water supply available for drinking purposes was obtained from the New York City drinking supply, and was satisfactory both as to quantity and wholesomeness.

After completing the inspection I was satisfied, if good discipline was maintained among the troops while aboard, and their quarters were kept thoroughly policed, that for short voyages at least the vessel could be kept in fair sanitary condition in spite of the numerous objectionable features above mentioned.

While I was on duty aboard the transport nine voyages were made from American to Cuban and Porto Rican ports. The first of these, viewed from a sanitary standpoint, being the most interesting, I will describe somewhat in detail.

On the morning of December 1 the transport left the dock at Savannah, Ga., bound for Casilda, Cuba, having on board the Fourth Tennessee Regiment of United States Volunteers, which was composed of 1,140 officers and men.

At 10.30 that morning, the vessel by that time being well out to sea, Major Balch, brigade surgeon, sanitary inspector First Division, First Army Corps, and myself, accompanied by the officer of the day, made an inspection of the transport and found the condition below very unsatisfactory. The troops had then been aboard only a few hours, but already had their quarters in a very filthy state. The men being allowed to have their rations in their quarters, had thrown around on the decks a large quantity of waste food matter, such as hard-tack, pieces of meat, apple and potato peels, emptied meat cans, trash, and slop water, all of which, added together and mixed with the thick coating of whitewash on the decks, presented a sanitary aspect that was appalling. The main deck, where the 250 horses and mules of the regiment were stabled, and where the troops' rations were prepared and served, was in a similar or worse state than the troop decks.

After the inspection was completed, the condition was reported to the general commanding the troops by Major Balch and to the transport quartermaster by myself.

After the first two or three days we succeeded in getting better police work done by the troops, and the condition of their quarters was markedly improved, but at no time during the voyage was it satisfactory.

The transport arrived off Casilda, Cuba, on the morning of December 8, and being run aground about 6 miles from shore, the troops were disembarked and the cargo discharged at that point and carried to Casilda by the *Munteo*, which had been sent there to assist in the discharge of the transport.

Before any of the troops were disembarked I obtained an official list of the cases of sickness that had existed among the troops during the voyage, which was as follows: Seasickness, 12; malaria, 5; indigestion, 1; cerebro-spinal meningitis, 1. The case of cerebro-spinal meningitis was ill when brought aboard the transport at Savannah, but was not diagnosed meningitis until several days later, when we were at sea. These sick cases were cared for during the voyage in a hospital

improvised by the stretching of awnings on the saloon deck aft, this being the most suitable place for it that was available.

One-half of the regiment was to be disembarked at Casilda and the other half to remain on the transport until the discharge of cargo was completed, when the transport was to take them to Tunas, a small town about 50 miles east of Casilda.

Before any communication had been held between the transport and the shore I went over to Casilda to investigate the health condition of the port, so that I could determine what precautionary measures should be enforced in order to keep the transport from becoming infected.

I obtained a certificate from the native health officer to the effect that no disease of a quarantinable nature was then existing, or had within the six months previous existed, either in Casilda or Trinidad—the latter being a city of 30,000 inhabitants and situated about 3 miles inland from Casilda.

On my return to the vessel I recommended that none of the crew be allowed to go ashore, and that no persons who had stayed ashore over night be allowed to sleep afterwards aboard the transport. This recommendation in regard to the crew was carried into effect, but several of the higher army officers, after spending several days and nights in Trinidad, occupied staterooms on the transport, my written protest to the contrary notwithstanding.

The half of the regiment that was to be left at Casilda disembarked on the afternoon of the 6th, leaving their quarters in a very filthy condition. Fearing that evil might result from the existence of so much filth on a vessel in that warm and moist climate, I obtained a detail of 30 soldiers and personally superintended the cleaning of the vacated quarters.

On December 7 the case of cerebro-spinal meningitis died and was taken ashore and buried.

On December 9 two other cases died of what was also reported cerebro-spinal meningitis, although no autopsies had been held and the cases up to the time of death were reported as pneumonia.

That night a board composed of the medical officers of the regiment convened and recommended that the remainder of the troops be removed from the transport at once and conveyed to Tunas by the *Manteo*. This recommendation was carried into effect the next morning, December 10.

Twenty native stevedores were employed to assist the crew in cleaning the vessel. The flooring on the orlop deck was taken up, boards supporting hammock stanchions removed, and in some places the cleats were knocked out, so that all concealed filth could be reached. Then the decks were scraped, scrubbed, and washed down with the hose. I tried to procure disinfectants in Trinidad with which to wash down the decks, but could not get a sufficient quantity to accomplish the purpose.

A number of very filthy hammocks I condemned and had destroyed, also the bedding, carpets, and all upholstery in the staterooms where two of the cases reported as meningitis had been taken for a few hours just before death. These rooms afterwards were cleaned mechanically and washed down with a strong solution of carbolic acid.

December 12 the transport proceeded to Tunas and there continued the discharge of cargo.

The next day seven invalided soldiers were brought to the transport for return passage to the States. As these cases were from among the first detachment that was disembarked at Casilda, I examined them carefully as they were brought up the gangway and found one of them to be a typical case of yellow fever. This case was turned back, taken ashore, and isolated. The other six were not in the least suspicious, but realizing the probability of their clothing being infected I urgently protested against their being allowed aboard the transport. As they were brought on in spite of this protest I had them isolated on the saloon deck for

the night and succeeded in getting them removed from the vessel early the next morning.

Discharge of cargo being completed, on December 15 the transport sailed from Tunas and arrived at New York City December 22, with no sickness on board.

We remained at New York thirty-six hours and then proceeded to Charleston, S. C.

While at New York workmen were engaged aboard the vessel knocking out the cleats and breaking up the cement on the decks, and during the run to Charleston the crew was worked hard removing the detritus and once more cleaning ship, this being the fourth time since the troops were disembarked at Casilda. Although I believed the vessel then to be in good sanitary condition from the mechanical cleaning, whitewashing, sunning, and airing that she had received, it was my intention to have the troop decks washed down with a strong solution of bichloride of mercury before troops were again brought aboard. But when we arrived at Charleston a detail of army officers was sent aboard to supervise this work, and I was relieved of the responsibility.

The second voyage was from Charleston, S. C., to Matanzas, Cuba, with the Twelfth New York Regiment of United States Volunteers aboard.

The transport regulations had then been adopted, and everything was done more systematically and consequently more satisfactorily. The vessel was inspected each morning by the commanding officer of the troops, the transport quartermaster, the master of the vessel, and myself. All of us being together in this way during the inspections, existing evils could be pointed out and remedial measures ordered at once.

At the end of each day I would submit to the transport quartermaster a written report of the sanitary condition of the vessel, with recommendations for such improvements as I thought necessary.

The voyage was short and uneventful.

Thorough police work was done by the troops and no sickness occurred. While at Matanzas the vessel lay in the harbor about 200 yards from shore and discharged the cargo on lighters. I made the usual recommendations as to communication between the transport and the shore and they were carried into effect in every particular. Four men of the crew who went ashore one night while there were discharged and not allowed to return on the vessel.

From Matanzas we went to Savannah, Ga., and during the run to that port the vessel was given a thorough cleaning. The staterooms were stripped of all bedding and upholstery and then scrubbed clean; the troop decks were first rendered mechanically clean and then mopped with a strong solution of either carbolic acid or bichloride of mercury; the forecabin was treated in the same way as the troop decks; the hold was washed down, and the bilges cleaned and disinfected.

By this method of cleaning, which was adopted for all subsequent voyages after troops had been disembarked and we were bound for a home port, the transport was kept in such good sanitary condition that if infection had been brought aboard it would have found a very unfavorable soil on which to develop a focus.

On the third voyage there were transported from Savannah, Ga., to Habana, Cuba, the following: A squadron of the Seventh Cavalry, with 756 horses; two batteries of the Second Artillery, the Seventeenth Signal Corps, and the Second Division Hospital Corps—all told, 1,159 men. Due to the crowded condition and the warm, sultry weather, there was considerable discomfort, and it was impossible for the troops to keep their quarters very well policed, but the voyage was short and no sickness of any moment developed.

At Habana I carried on a hard but unavailing struggle to keep the transport free of the possibility of becoming infected. To begin with, the vessel was taken to San Jose wharf and docked. This wharf was pronounced infected at that time

by Sanitary Inspector Brunner. Marine-Hospital Service, and I made a written recommendation that the vessel lay in the harbor away from the dock and discharge on lighters. The crew was given shore liberty at night in spite of my numerous protests. Fifty passengers, consisting of army officers, discharged soldiers, teamsters, etc., were to be returned to the States on the transport. As there were six cases of yellow fever and nine cases of smallpox then reported in Habana, and as some of these passengers were from regiments in which smallpox existed, I insisted on the disinfection of their baggage before it was brought aboard, but notwithstanding this it was taken on without being disinfected.

All of my protests and recommendations were made in writing, so if the transport had become infected I would have been free of responsibility.

When we reached the quarantine station at Savannah, Ga., I had all of this objectionable baggage taken off and disinfected, it being forwarded to the passengers afterwards.

The fourth voyage was likewise from Savannah to Habana, there being aboard a squadron of the Seventh Cavalry, which consisted of 775 officers and men, with 725 horses.

The voyage was uneventful, quarters kept in good condition, and no sickness was aboard.

At Habana similar difficulties were encountered, as on the previous voyage, and with similar results.

Baggage of the return passengers was disinfected at the Savannah quarantine as before.

Fifth voyage: Savannah, Ga., to Matanzas, Cuba, with 690 officers and men of the Second Cavalry and 726 horses aboard. Everything was done satisfactorily and nothing of note occurred.

Sixth voyage: From Savannah, Ga., to Cienfuegos, Cuba, with 690 officers and men of the Second Cavalry and 726 horses aboard.

We arrived at Cienfuegos February 21, and the troops were disembarked and the cargo discharged on lighters. There was very little communication with the shore, and this mainly by daylight and only by the officers of the vessel.

From Cienfuegos the transport proceeded to San Juan, P. R., where the Twelfth New York Regiment of United States Volunteers was taken aboard and transported to New York City.

My method of procedure to keep infection from being brought aboard by troops embarking at a foreign port for transportation to the States was briefly as follows:

First. I would go over to the port and make inquiries regarding the health of the port and surrounding country. This information, of course, was very easily obtained when I was so fortunate as to find an officer of the United States Marine-Hospital Service on duty at the port.

Second. Before the troops were brought aboard I would obtain from a responsible medical officer, the regimental surgeon usually, a certificate to the effect that no infection existed among the officers or troops of the regiment, and when coming from any localities in which any case of smallpox was reported this certificate also stated that the troops were protected by vaccination.

Third. I would inspect the troops as they came aboard the transport, holding up the sick or suspicious looking cases for a more careful examination.

The transport sailed for New York City March 4 and arrived there March 10.

Quarters were kept in fairly good condition and with the exception of several cases of respiratory disease, probably caused by the change of climate, no sickness developed aboard during the voyage.

We remained at New York five days, and during this time improvements were being made on the vessel. The decks were given a coat of asphaltum varnish, the drinking water tanks were cleaned, this being the first time for several months, and a hospital with capacity for 30 patients was constructed on the main deck aft.

The seventh voyage was from New York to Nuevitas, Cuba, without passengers, and the Third Georgia Regiment of United States Volunteers was taken aboard at Nuevitas and conveyed to Savannah, Ga.

On March 26 we arrived at Savannah quarantine with no suspicious cases aboard. Under the supervision of the United States Marine-Hospital Service officers then in charge of the quarantine work for transports coming to that station, the troops were disembarked and their baggage disinfected, after which they were allowed to proceed to the city.

Eighth voyage: From Savannah quarantine to Habana, Cuba. Arrived at Savannah on the morning of March 29 and left there with the One hundred and sixty-first Indiana Regiment of United States Volunteers aboard on the afternoon of the same day. Arrived at Savannah quarantine March 31, just one day ahead of the close quarantine season, and therefore the baggage was disinfected but the troops were not detained afterwards.

The ninth and last of my voyages on the transport was from Savannah, Ga., again to Habana.

At Habana the Third Nebraska Regiment of United States Volunteers was taken aboard and conveyed to Savannah quarantine, where the troops were taken off for disinfection of baggage and five days' detention, it then being April 12.

The transport was sent to the South Atlantic quarantine for disinfection and detention, after which she went to the dock at Savannah.

No suspicious cases of sickness had occurred on the transport during the transportation of the regiments from Cuba.

I was relieved of duty on the transport by Bureau (telegraphic) order of April 22, an army medical officer succeeding me as sanitary inspector.

Respectfully, yours,

L. L. LUMSDEN,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON TRANSPORT SERVICE BY ASST. SURG. L. D. FRICKS, U. S. M. H. S.

SAVANNAH, GA., June 5, 1899.

I have the honor to make the following report of duties while acting as medical inspector and ship's surgeon on board U. S. transport *Sedgwick* from March 15 to May 6, 1899.

In obedience to orders from the Bureau I relieved Assistant Surgeon Grubbs at Newport News, Va., and the transport, carrying freight and mules, was started on a return trip to Santiago, Cuba, March 20. Immediately on leaving Newport News preparations were begun for placing the ship in a proper condition to receive troops at Santiago. All of the walls, floors, and ceilings on upper and lower troop decks were washed down and then whitewashed. The ship's bilges were flushed with sea water and afterwards pumped out every second day during each passage.

A sick call was made by me every morning at 9 a. m., and the sick and disabled sailors among the crew or in the ship's hospital were treated at this time. At 10 a. m. a general inspection of the ship was made by the quartermaster, ship's captain, and surgeon, accompanied by the regimental commanding officer and surgeon when they were on board. I also inspected the water supply of the troops and their water-closets again at 6 p. m.

The transport reached Santiago, Cuba, March 24, without having had any sickness on board, and was anchored well out in the bay. We were boarded by Dr. Caminero, sanitary inspector of the port, and I was informed both by him and by Dr. Rosenau that there were at that time no known cases of yellow fever in Santiago. Dr. Rosenau also advised me that the water supply at Santiago

was not good, and it was decided not to fill any of the ship's water tanks there, but to depend on that remaining in the after tanks and that made by the distilling apparatus each day.

The engines distilled 2,000 gallons per diem, and with 1,000 troops on board did not accumulate any reserve supply in case of accident. At Santiago the Fifth Regiment of Immunes was embarked for Guantanamo, Baracoa, and Sagua de Tanimo. There was no sickness among the troops of this regiment while they were on the *Sedgwick*.

The Third Regiment of Immunes, Colonel Ray commanding, was taken on board at the above-named ports and returned to the United States. All of these troops were inspected at the gangway and no quarantinable disease was found among them.

The transport *Sedgwick* left Sagua de Tanimo March 29 for Savannah, Ga., reaching there April 2. During the passage there were 20 patients in the regimental hospital, principally malarial fevers; tubercular phthisis, 1; dysentery, 3. Among the cases of malaria three developed hamaturia, with icterus and some vomiting.

The *Sedgwick* reached Savannah April 2, and was remanded to South Atlantic quarantine for fumigation and detention. After disinfection of their personal baggage the troops were placed on Blackbeard Island for detention. The vessel was disinfected and after two days stay the troops were brought back to the transport and carried into Savannah.

The *Sedgwick* left Savannah for Cienfuegos, Cuba, April 14, carrying the Second Regiment of regulars, the same sanitary precautions as stated in last passage being taken. On reaching Cienfuegos we anchored well out in the bay, and the troops were disembarked, and those returning were brought back to the transport on lighters. These were all inspected at the gangway. One suspected case was reported as having occurred at the regimental hospital two weeks previous, and one was rejected at gangway as being "suspicious." Owing to the crowding of the transport the sanitary condition was not so good returning to the United States. This was due chiefly to the limited water supply.

The transport reached Savannah quarantine April 26, and unloaded the troops and their baggage for disinfection and detention on Daufuskie Island. The *Sedgwick* then proceeded to South Atlantic quarantine for fumigation and detention of crew, afterwards returning to Savannah, Ga., where I was relieved May 6.

My relations with the ship's officers were always pleasant, and all suggestions made by me as to the health of the crew or the sanitary condition of the ship were carried out promptly. The *Sedgwick* not having been built for a transport nor properly remodeled, it was impossible to make 1,000 troops comfortable on board or to keep them in perfect sanitary condition.

Respectfully, yours,

L. D. FRICKS,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON TRANSPORT SERVICE BY ASST. SURG. JOHN McMULLEN, U. S. M. H. S.

OFFICE OF MEDICAL OFFICER IN COMMAND. M. H. S.,
Portland, Me., June 10, 1899.

SIR: In pursuance of instructions contained in Bureau letter of the 2d instant, I have the honor to submit for publication in the annual report of the Service the following report, summarizing my reports on board the transports of the United States Army:

In compliance with Bureau telegram dated October 5, 1898, I reported October

8, 1898, for duty as sanitary inspector on board the U. S. Army transport *Mississippi*, afterwards renamed *Buford*, and was detached May 15, 1899.

The transport plied between New York, San Juan and Ponce, P. R., and Santiago de Cuba, carrying regimental, commissary, and quartermaster stores, and transporting regiments and recruits to and from these points.

The enlisted men were quartered on the lower decks and slept in canvas hammocks swung from stanchions, allowing a space of about 21 inches between the hammocks. The water-closets for the soldiers were 4 in number, all situated on the main deck, 2 forward and 2 aft. These consisted of long troughs, zinc lined, and about 18 inches in depth, through which water was kept flowing constantly.

I made regular daily inspections of the ship to see that it was kept clean, and any unsanitary conditions were immediately reported to the quartermaster in charge of the ship with recommendations for their remedy. This officer usually endeavored to comply with my recommendations immediately, and the sanitary condition of the vessel was usually good, notwithstanding she was formerly a cattle ship.

On one round trip only were there medical officers of the Army on board to care for the soldiers; and as there was always quite a number of enlisted men on board both coming and going, I had professional care of them in addition to the crew, which numbered usually between 90 and 100.

The crew was mustered on the spar deck aft always before reaching the first port and the vaccination marks inspected; those who had not had smallpox and could not show a recent successful scar were vaccinated.

All fresh water taken aboard was inspected as to its quality for potable water.

There was no sick bay or other place on board for the proper care of the sick, and for this reason I objected to any steerage passengers embarking when ill. The quartermaster in charge sustained me in this; and as I always inspected them at the gangway, those found to be sick were recommended in a letter to the quartermaster to be sent to a hospital on shore, which was always done.

The vessel anchored out in open bay at all southern ports save San Juan, where the water was of sufficient depth to go alongside the dock. I endeavored in every way to prevent the transport from becoming infected, and the crew was usually forbidden to go ashore in any of the southern ports, and, if it was deemed necessary, through steerage passengers were also forbidden. The number of cabin passengers was usually very small.

In February, when smallpox became epidemic in Ponce, I required all persons to show vaccination certificates before embarking or be vaccinated on board. Later a few cases occurred at San Juan and Santiago, when certificates were required there also. These certificates were previously inspected by a medical officer of the Marine-Hospital Service, with whom I always conferred upon reaching port. Altogether there was comparatively little sickness of importance. Measles, chicken pox, and one case of yellow fever were the contagious diseases which developed on board. The yellow fever occurred in November en route from Santiago to San Juan. The patient was a cabin passenger who embarked at the former place but had been living at San Luis, a small town 30 miles from Santiago. No sickness was noted among passengers upon sailing from Santiago. Several cases of fever developed, however, en route, and when the vessel arrived at San Juan there were five cases of fever on board—one cabin and four steerage. At first I considered them all to be of malarial origin, but the symptoms of the cabin passenger before entering San Juan Harbor caused me to believe it to be a suspicious case of yellow fever and I so reported it to the health officer at San Juan. He refused to see the case but reported it to the Governor-General, and the vessel was immediately ordered (by military authority) to anchor far out in the harbor and hoist the yellow flag. The case was removed to the lazaretto and in a few days diagnosed as a genuine case of yellow fever. Immediately after the patient

was removed from his room the bedding, etc., were all burned, and a few pounds of sulphur having been found on board, the room was fumigated, locked, and no one allowed to go in.

I disinfected the vessel as well as possible under the circumstances, as all the passengers (146) were kept on board for some days, and it was a difficult matter to get the disinfectants from shore. However, when I succeeded in getting the materials, the vessel was closed as well as possible and subjected to sulphur fumes. Bichloride solution was freely used about the cabins and whitewash and paint wherever possible. No other cases of yellow fever developed and the vessel was ordered to New York, after being in quarantine one week, where we were quarantined twenty-four hours, or sufficient time to disinfect all clothing, as I had no facilities for doing this on board. No further efforts were made to disinfect the ship, as the quarantine officer said that what I had done was quite sufficient. During the San Juan quarantine, and until the vessel reached New York, all on board were mustered each morning for inspection. Most of the passengers were taken off at San Juan, but no freight was landed.

The cases of chicken pox and measles were isolated as well as the facilities of the ship would permit, put ashore at the first port and the quarters disinfected by means of bichloride solution.

A few bodies were brought to the States from time to time, but were always in metallic cases.

On my last trip it was the intention of the San Juan authorities to embark at least 800 discharged soldiers for New York via Santiago. In consideration of the fact that there were already 300 soldiers on board for the latter place, I thought it best for sanitary reasons that not more than 600 embark, and so informed the quartermaster in charge by letter. He referred my letter to the governor-general, who sustained my recommendation.

In view of the large number of soldiers on this trip, and in compliance with my request for medical assistance, the chief surgeon of Porto Rico detailed Acting Asst. Surg. John E. Morris, U. S. A., to report to me for duty at Ponce.

My duties as sanitary inspector were decidedly more satisfactory after officers of the Marine-Hospital Service were detailed for duty at the several ports of Cuba and Porto Rico.

The quarantine officer at New York always boarded the vessel, but accepted my certificate as to the conditions on board. Upon reaching New York all sick soldiers were sent to the hospital on Governors Island and the sick of the crew to the marine hospital on Staten Island.

Respectfully, yours,

JOHN McMULLEN,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON TRANSPORT SERVICE, ASST. SURG. H. B. PARKER, U. S. M. H. S.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
Santiago de Cuba, October 26, 1899.

SIR: I have the honor to make the following report of my duties as sanitary inspector on board the U. S. Army transport *Minnewaska*, afterwards named the *Thomas*.

In compliance with telegraphic instructions I reported to Colonel Kimball September 3, 1898, and was immediately assigned to duty.

The transport *Thomas*, formerly a passenger, cargo, and cattle ship in the western ocean trade, is 465 feet long and has a register of 5,500 gross tonnage. It has four hatches, with decks as follows: Hold, orlop, between, main, spar, and prome-

nade. There were cabin accommodations for 100 passengers; the second-class accommodations were on the between and orlop decks and according to necessities could accommodate from 1,250 to 1,400 men. The main deck could in addition accommodate about 350 horses.

On the main deck forward were located the forecabin and hospital, aft the latrine. This latter consisted of a V-shaped trough running around the after end and sides of the after compartment. Water constantly flowed through this trough, so that with an occasional cleaning it was always in a good sanitary condition.

The compartments of the enlisted men were sparsely furnished. They were subdivided by rows of stanchions, each stanchion supporting one end of four hammocks. The decks were of iron and easily cleaned. The ventilation was satisfactory in a cool atmosphere. After entering the Tropics it was almost impossible to prevent discomfort; the upper decks, however, were large enough to accommodate all who wished to sleep in the open air. The ventilating system consisted of four steam fans with pipes radiating to the various compartments. Quarters were lighted by electricity.

The cooking arrangements were located on the after deck and ample if properly conducted. They consisted of four double-jacketed steam boilers, each with an average capacity of 100 gallons.

The water supply was generally good. At only one place, Charlestown, S. C., was the water of such a nature that it was to a certain extent disagreeable. Fresh water there was always in abundance; the ballast tanks being filled at each port, carried about 1,150 tons.

The hospital was on the main deck forward. For the first two voyages there were no special arrangements for the sick. The No. 1 between deck was used for that purpose, cots being supplied to the sick. Afterwards a separate compartment was built on the main deck; it could comfortably accommodate about eight men. The first two return voyages from Porto Rico a number of sick were carried, but during the succeeding voyages, by excluding those requiring special nursing and diet, the number was considerably diminished. At several ports sick were sent on board practically in a dying condition, but upon representing the accommodations to the medical officers they would be referred back to the hospital from whence they came. I afterwards inspected the sick on shore in order to prevent their transportation and return. A certificate was always obtained certifying that there were no contagious diseases among the troops. Only once, from Savannah, Ga., to Nuevitas, did a contagious disease—measles—develop on board. There was but one case. On the succeeding voyage one case developed among the crew, but as he was shipped at Port Tampa I have no reason to think that there was any connection between the cases.

Troops were generally inspected as they came on board; occasionally this was impossible. At times they were embarked at night, or came on board at several parts of the ship at the same time.

On the return voyage to a port in the United States troops were inspected twice daily, in the morning in quarters after police call and again in the afternoon. The day of entry to the port and the preceding day they were inspected by battalions on the spar deck. This was easily done; companies were formed in quarters and marched up on the spar deck and inspected by battalion; the quarters and sick were then inspected. A superficial inspection of a regiment seldom took more than three-fourths of an hour. Arriving at quarantine a certificate was given the officer, giving the condition of the troops and their baggage.

Two ports that were visited were known positively to be infected, namely, Santiago and Habana. I was under the impression when I was at Santiago in September, 1898, that the disease represented as yellow fever was one of the fevers of malarial infection, but now, after having seen a number of cases from onset to recovery or death, I believe I was in error, the common mistake made by nearly

all medical men last year. I am also satisfied that the two cases of fever that appeared on board, one a passenger the other one of the ship's crew, was of this type of fever. Their quarters were disinfected at Ponce as a precaution.

At Habana it was the custom for ships to dock at the "Real" wharves and discharge cargo. There was always more or less communication with the shore, but as far as I am aware there was no infection on board.

A regiment of troops returning to the States usually brought from 150 to 250 tons of baggage; occasionally an enlisted man would have several trunks, all kinds of animals, birds, and relics, from buttons to a full Spanish uniform.

The last voyage from Cienfuegos to Savannah being made after the beginning of the close quarantine season, the troops were detained in quarantine after disinfection of the baggage.

The appended table gives a list of the number of passengers and the character of the cargo.

In compliance with telegraphic instructions May 28, I was detached from the ship after nearly eight months' service, and proceeded to Santiago de Cuba.

Respectfully, yours,

HERMAN B. PARKER,
Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure.]

Date of departure.	Port of departure.	Destination.	Date of arrival.	Passengers.	Horses.	Cargo.
Sept. 6, 1898	New York	Charleston	Sept. 9, 1898	30		Forage.
Sept. 14, 1898	Charleston	Santiago	Sept. 18, 1898			Do.
Sept. 28, 1898	Santiago	Ponce, P. R.	Sept. 30, 1898	30		Do.
Oct. 11, 1898	Ponce, P. R.	New York	Oct. 17, 1898	1,450	20	
Nov. 6, 1898	New York	Ponce, P. R.	Nov. 11, 1898			Do.
Nov. 19, 1898	Ponce, P. R.	New York	Nov. 25, 1898	1,200	25	
Nov. 28, 1898	New York	Savannah	Nov. 30, 1898			
Dec. 2, 1898	Savannah	Habana	Dec. 5, 1898	1,000	300	Commissary.
Dec. 9, 1898	Habana	Savannah	Dec. 11, 1898			
Dec. 16, 1898	Savannah	Habana	Dec. 19, 1898	1,000	300	Do.
Dec. 24, 1898	Habana	Charleston	Dec. 27, 1898			
Dec. 30, 1898	Charleston	Cienfuegos	Jan. 4, 1899	1,200	300	Do.
Jan. 11, 1899	Cienfuegos	Savannah	Jan. 14, 1899			
Jan. 18, 1899	Savannah	Matanzas	Jan. 21, 1899	1,000	300	
Jan. 25, 1899	Matanzas	Savannah	Jan. 28, 1899			
Feb. 2, 1899	Savannah	Nuevitas	Feb. 5, 1899	600	825	Do.
Feb. 10, 1899	Nuevitas	Port Tampa	Feb. 14, 1899	38		
Feb. 19, 1899	Port Tampa	Santiago	Feb. 23, 1899	250	800	Do.
Mar. 1, 1899	Santiago	Newport News	Mar. 5, 1899	830	30	
Mar. 13, 1899	Newport News	Habana	Mar. 17, 1899			
Mar. 18, 1899	Habana	Savannah	Mar. 20, 1899	850	30	
Mar. 24, 1899	Savannah	Matanzas	Mar. 26, 1899			
Mar. 27, 1899	Matanzas	Savannah	Mar. 29, 1899	850	30	
Apr. 5, 1899	Savannah	Habana	Apr. 8, 1899	79		
Apr. 9, 1899	Habana	Cienfuegos	Apr. 11, 1899	2		
Apr. 14, 1899	Cienfuegos	Savannah	Apr. 17, 1899	750	30	
Apr. 28, 1899	Savannah	Guantanamo	May 2, 1899			Do.

REPORT ON TRANSPORT SERVICE BY ACTING ASST. SURG. J. SPENCER HOUGH,
M. H. S.

WASHINGTON, D. C., November 10, 1899.

SIR: I have the honor to submit the following report, being a summary of my former reports of my service on board the U. S. transport *Roumanian*:

Acting on Bureau orders I joined the ship at New York on October 1, 1898, and my service lasted six months.

The *Roumanian*, a four-masted, schooner-rigged steamship, 435 feet in length, 2,703 net tonnage, was designed for cattle and freight trade, and had very scant passenger accommodation. The decks were leaky, and the sanitary arrangements

were very imperfect and much in need of repairs. The water-closet arrangements were especially bad, being such that when washing down decks or using the steam winches the bowls could not be flushed. One closet, that of the engineers, could not be used on account of defective pipes.

The ship was engaged in transporting troops and supplies between the islands of Cuba and Porto Rico and the United States, and the following voyages were made:

The ship sailed from New York October 1, 1898, embarked the Fourth Immune Regiment, United States Volunteers, at Fernandina, Fla., and arrived at Manzanillo, Cuba, on October 17. The troops were quartered on the troop deck, below the main deck, and each man was required to keep clean that portion of the ship immediately about his hammock. The horses and mules were stalled on the promenade deck.

Daily inspections of the ship were made by myself, accompanied by the regimental surgeon and police officer. Most rigid discipline was enforced by Col. J. S. Petit, in command of the regiment, and throughout the voyage the ship was kept in perfect condition. Several cases of typhoid fever developed in the regiment, the disease having been contracted in camp at Jacksonville. The ship having no hospital, these cases were accommodated in hammocks swung in the starboard alley. This space was afterwards reserved for the hospital.

Six days were required to discharge the cargo at Manzanillo, the work being done by native stevedores, thus establishing an unavoidable communication with the shore. The health reports received of Manzanillo were good. After the Fourth Immunes had landed, Col. P. H. Ray came on board with a battalion of the Third Immune Regiment, and they were taken to Caimanera, on Guantanamo Bay. Yellow fever prevailing in this town, none of the company were allowed ashore. From here the ship proceeded to Ponce, P. R., and after two days waiting went to Arroyo, where the Third Illinois Volunteer Regiment were embarked, and New York was reached on November 9. The homeward voyage was uneventful, the ship was well policed and its sanitary condition good.

Sailed from New York November 13 for Port Tampa, Fla., where 300 mules and a cargo of supplies were taken on board. Arrived at Habana, Cuba, December 1. Against the protest of Sanitary Inspector Brunner and myself the ship was allowed to remain alongside the San Jose wharf, a known yellow-fever infested spot. While at dock it was impossible to keep the crew on board, and they spent the nights ashore, thus increasing the danger of infecting the ship. This was repeated on each trip to Habana, and practically no attention was paid to my recommendations.

From Savannah, Ga., three trips were made to Habana; on December 8, 1898, December 21, 1898, and January 3, 1899, carrying the First North Carolina, the Sixth Missouri, and the Second South Carolina regiments. Two of these regiments showed an utter disregard of all sanitary measures and left the ship in a filthy condition. The same conditions prevailed at Habana as on the first trip.

On January 14 the ship sailed from Savannah, with the Third Georgia Volunteer Infantry on board, and arrived at Nuevitas, Cuba, on January 18. While en route 18 cases of measles and several of mumps developed among the soldiers. From Nuevitas the ship returned to New York, arriving on January 29, 1899. Capt. Charles E. Taymen was then placed in command of the ship, which was detailed to transport to this country the American dead in Cuba and Porto Rico.

Two trips were made from New York, on February 4 and April 5, and about 1,200 bodies were brought back. A party of undertakers accompanied the ship and the bodies were disinterred by them and brought on board at Ponce and San Juan, P. R., and at Santiago and Guantanamo Bay, Cuba. Some of the deceased had died of wounds received in battle, and many of diseases incident to camp life and the climate, including malarial and typhoid fevers, and a few of yellow fever, though the majority of the latter were left at Santiago. It is believed a few

bodies, dead of smallpox, were returned from Ponce. The undertakers remained ashore during the time of disinterment of the bodies, and then had their clothing disinfected when they returned aboard. The bodies were wrapped in sheets, wet with a solution of mercury bichloride, and sealed in metal-lined oak caskets, and these incased in pine boxes. Each box as it came on board was washed with the bichloride of mercury solution.

The ship returned to New York on April 26, and this was my last voyage, being relieved by Acting Assistant Surgeon Taylor, United States Army.

At times during my service it was impossible to use the precautions required to prevent infection of the ship. This was partly due to the need of landing the troops and supplies in great haste, and due partly to a failure on the part of the quartermaster to appreciate or realize the necessity of such precautions. This trouble ceased when Captain Taymen took command of the ship.

The crew was kept protected from smallpox by vaccination, and a number of passengers coming aboard without bills of health were vaccinated en route.

The water supply throughout was good, being obtained either from New York or Savannah. Only once did we take water at a foreign port. This was at Ponce, but as it was very muddy and the means of transportation unsatisfactory, it was placed in separate tanks and not used for drinking purposes.

The quality of the food supplied was of the best. However, on account of an improperly placed and constructed ice box much of the meat would decompose. On one occasion I condemned and had destroyed about 6,000 pounds of meat. The enlisted men were served regular army rations, which seemed sufficient both in quantity and quality.

The troop deck was plentifully supplied with fresh air by large ventilating fans, and except during storms and high seas, when the air ports were closed, no complaints were made. The officers fared worse. The staterooms, being between decks and between alleyways, were never well ventilated. At times mules were carried in these alleys, and then the manure and decomposed urine rendered the rooms unfit for use.

It was very difficult to obtain any reliable information relative to the health and sanitary status of the ports visited. There was a decided tendency on the part of the native health officials to misrepresent the true conditions. The boarding of the ship by the native quarantine officer was a mere matter of form, and at times he had come and gone without making his business known.

With the exception of a case of typhoid fever, two of pneumonia, and several of malarial fever, the cases that came under my care while on board were of minor diseases and injuries.

I am pleased to acknowledge many kindnesses and courtesies from the officers of the Marine-Hospital Service. I am especially indebted to Surgeon Glennan, at San Juan; to Passed Assistant Surgeon Rosenau, at Santiago, and to Sanitary Inspector Brunner, at Habana, for much help and advice in connection with my duties while at their stations.

Respectfully,

J. SPENCER HOUGH,

Acting Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON TRANSPORT SERVICE, BY ACTING ASST. SURG. E. F. McCONNELL,
M. H. S.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Habana, Cuba, June 5, 1899.

SIR: In accordance with the instructions contained in the Department letter of the 2d of May, I have the honor to make the following report of my services upon the U. S. Army transport *Kilpatrick*, from February 24 until May 18, 1899.

On the 24th of February I reported for duty on the *Kilpatrick* at Savannah, Ga., and found her ready for sea.

The ship is of iron, of about 3,000 tons, and built for the cattle trade. Since coming into the Government service but little change in the construction of the vessel has been made. The troop quarters are both forward and aft, and consist of an orlop and main deck forward and a main deck aft. These decks are fitted with wooden stanchions from which hammocks are slung, accommodating about 800 men. The decks are of steel, but are decidedly deficient in scuppers and waterways, thereby making it difficult to thoroughly wash and cleanse them. The orlop deck is very imperfectly lighted, thus making thorough inspection impossible, and derives its ventilation by two hatches only. This deck is not used for troops, therefore, when it is possible to avoid it.

The main troop decks are well lighted and contain a number of ventilators and two large steel fans. A number of the ventilators are seemingly permanently closed. These I have recommended to be opened. The latrines are four in number, and consist of wooden, zinc-lined troughs flushed by means of a steam pump. Until a short time ago this pump was too small for the work required, but a larger one has since been placed in the ship and no difficulty is now experienced in the proper flushing of these closets.

The cooking for the soldiers is done by means of large steam kettles, and is easily kept in a clean and sweet condition.

The cold-storage chamber is located in the after lower hold, and the refrigerator on the main deck amidships. These places are scrubbed and washed when the vessel is in a home port, and such cleaning as is possible is done each day.

The crew's quarters are in the forecastle and are decidedly unsanitary; the ventilation is not sufficient, and the men should be berthed in hammocks instead of wooden bunks; it would then be possible to inspect these quarters properly and to keep them clean, but until the vessel undergoes alterations I can not see how these defects can be remedied.

When I joined the vessel I found the crew's bedding old and dirty. I recommended its being destroyed, and further that one day each week be set aside for the airing of bedding and scrubbing of the quarters. The bedding was ultimately burned, but the latter part of the recommendation was never carried out.

The cattle-carrying arrangements are very bad; the scuppers and waterways being too small to admit of the droppings, etc.; it is therefore necessary to leave all work of cleaning after the animals until they are put ashore. The entire ship is particularly deficient in this respect, water standing in the cattle pens until taken up in buckets and shovels.

The ship had no hospital or proper place to care for the sick when I joined her, but on my recommendation one was built and will accommodate a patient. The stock of drugs, medical supplies, etc., I procured from the Army, and found no difficulty at all in getting a complete supply.

The vessel left Savannah on February 24, 1899, bound for Matanzas and Habana, having on board a detachment of soldiers for these places. Inspection of the ship was made twice daily by the commanding officer and myself. I found the lack of discipline of the volunteer troops interfered greatly with keeping the ship in a proper sanitary condition. These men would throw the leavings of their meals upon the deck and in the sink and latrines, but by constant watching and many recommendations to the officer in charge, the ship was kept clean.

On this ship I vaccinated the crew and such of the engine force as could be spared from duty; those left were vaccinated from time to time.

The vessel arrived at Key West, Fla., on February 27, taking on a 500-bed military hospital. We remained in Key West, twenty-four hours and reached Habana on the evening of the 28th, tying up at San Jose wharf. I protested, in writing, to the commanding officer against taking the vessel alongside of the wharf, but despite my protest the ship was taken in.

The crew, upon my recommendation, was not allowed liberty. I also recommended that the troops aboard bound for Matanzas be given no shore leave at Habana. Captain Baker recommended to the officer commanding the troops that my suggestion be followed, but nevertheless the troops went back and forth at will.

We arrived in Matanzas on March 4, and left for Habana on the 7th. In Habana we embarked the First Maine Artillery and followers, numbering 487 men. From the medical officer in charge I secured a general certificate of health of the entire command. In addition to the regiment we had aboard 166 passengers and 6 horses. Before the embarkation of troops, the troop quarters were thoroughly cleaned, painted, and whitewashed.

The usual inspections of the troops were made during the trip from Habana to Sapelo Quarantine Station, and, in addition, sick call and muster of the crew daily.

We arrived at Sapelo on the 11th of March, and the work of disinfecting the soldiers' clothes and baggage began immediately. Twenty stowaways were discovered on the trip: these men were vaccinated and their clothes disinfected.

The vessel arrived at Savannah on the 15th of March. The illness of the crew on the voyage consisted of 1 case of broncho-pneumonia, 2 cases of enteric fever and minor ailments, 3 cases of enteric fever and 2 of measles among the troops. On the 18th of March the *Kilpatrick* left Savannah for Matanzas, having on board 2 officers, 4 civilians, 180 soldiers, 2 teamsters, and 28 horses. On this trip no incident of interest arose. The passengers and crew continued in good health, with the exception of two cases of measles among the troops. The ship arrived at Matanzas on the 21st of March, and at Habana on the 28th. On the 25th we embarked the First Texas Volunteer Regiment, consisting of 558 enlisted men, 26 officers, 10 civilian employees, 4 civilians, 3 women, and 3 children. The vessel arrived at Dry Tortugas on the 26th, and on the 29th disinfection of the troops began and we finished on the 30th. I was asked by Captain Baker, commanding, to prepare a plan for getting at the baggage, clothing, etc., which I did, my recommendations being as follows:

First. That the companies of the First Texas be mustered at 6 o'clock, a. m., March 29.

Second. That each man be instructed to bring with him his entire belongings, including his hammock.

Third. That each officer leave his room open and his belongings in the room.

Fourth. That after the companies are mustered an inspection of the quarters be made in order to be certain of the removal of all baggage necessary to be disinfected.

The *Kilpatrick* reached Galveston, Texas, on April 2, and the soldiers were disembarked that day. The illness on this voyage was but slight and consisted of minor surgical cases, ailments, etc.

The ship left Galveston on April 4 for Matanzas, where we arrived on the 8th. The troop quarters were fully painted and whitewashed, so the vessel presented a neat and clean appearance when the Third Kentucky Volunteer Infantry embarked. This command consisted of 29 officers, 661 enlisted men, 19 civilian employees, and 9 horses. The ship was inspected by the chief surgeon, Department of Matanzas, and pronounced in good sanitary condition.

By some mistake a number of persons without transportation came aboard, mingling with the soldiers. Thirteen of these men were vaccinated and kept isolated until disembarkation at Savannah quarantine station. Daily inspections were made and the vessel's quarters kept in excellent condition until the last day, when the soldiers were served with a meal just prior to disembarkation. The *Kilpatrick* arrived at Sapelo on the 12th; then the ship was fumigated and disinfected and remained the required five days, arriving at Savannah on the 19th of April.

The *Kilpatrick* left Savannah on the 23d of April for Matanzas, where she arrived on the 26th. There were 144 enlisted men and 1 officer on board. The fact of these men being under the direct control of the ship's officer made it easier to insure cleanliness than experienced heretofore under the usual conditions.

At Matanzas no liberty was allowed to either officers or crew. The ship arrived at Habana on the 29th of April, and anchored in the stream, but owing to certain repairs necessary to the machinery a gang of stevedores and shore mechanics came on board, thus destroying effective quarantine. On May 3, the vessel left Habana for Nuevitas, Cuba, and arrived at that port on the 9th. There we embarked 414 enlisted men and 2 officers; from Nuevitas we sailed for New York, and arrived there on the 15th. The usual routine was observed during the trip. Owing to a stoppage of the refrigerating apparatus the supply of fresh meat spoiled. I therefore recommended that this beef be destroyed; acting upon this recommendation the commanding officer caused 13,225 pounds of beef to be thrown overboard.

The illness on this trip consisted mainly of minor surgery and intestinal disorders, and one case of malarial fever. Among the troops there were several cases of malarial fever.

In conclusion, I wish to state that Capt. C. F. Baker, U. S. V., commanding the *Kilpatrick*, and his officers have treated me with every courtesy and consideration. Very respectfully,

E. F. McCONNELL.

Acting Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE HOSPITAL SERVICE.

MEDICAL INSPECTION OF IMMIGRANTS IN CUBA AND PORTO RICO.

By reason of the outbreak of plague in Portugal, and the danger of transmission of the same from Spanish ports to Cuba, the following correspondence was entered into, resulting in the War Department assigning to the medical officers of the Marine-Hospital Service stationed in Cuba the duty of inspecting arriving immigrants:

TREASURY DEPARTMENT,

Washington, September 2, 1899.

SIR: I respectfully invite your attention to War Department Circular No. 13, Division of Customs and Insular Affairs, dated April 14, 1899, declaring that the laws and regulations governing immigration to the United States are to be in effect in the territory under government by the military forces of the United States, and directing collectors of customs to enforce said laws and regulations until the establishment of immigration stations in the said territory. Also, to the immigration regulations for the island of Cuba, issued by the War Department June 6, 1899. I would further invite your attention to the immigration laws and regulations of the United States, dated April 25, 1893, in which, under section 8, it is prescribed that the medical examination of alien immigrants shall be made by surgeons of the Marine-Hospital Service; this section being amended by act approved March 3, 1893, to read:

"That the medical examination of arriving immigrants * * * may be made by any regular medical officers of such Marine-Hospital Service detailed therefor by the Secretary of the Treasury, and civil surgeons shall only be employed temporarily from time to time for specific emergencies."

The immigration regulations for the island of Cuba before referred to do not prescribe any examination for alien immigrants. A considerable proportion of the immigration to Cuba is from Spain. Spain having very close commercial

relations with Portugal, where bubonic plague exists at the present time, it is of particular importance that all immigrants arriving in Cuba be subjected to a thorough medical examination. Officers of the Marine-Hospital Service are stationed at all of the important ports in Cuba and are available for this duty.

I have, therefore, to request that, if not in conflict with existing regulations or orders from your Department, this work be assigned to the medical officers of the Marine-Hospital Service.

Respectfully, yours,

L. J. GAGE, *Secretary*.

The SECRETARY OF WAR.

WAR DEPARTMENT,

Washington, September 7, 1899.

SIR: I have the honor to acknowledge the receipt of your letter of the 2d instant asking that the duty of making a thorough medical inspection of immigrants from Spain arriving in Cuba be assigned to the medical officers of the Marine-Hospital Service stationed there.

Maj. Gen. John R. Brooke, governor-general of Cuba, has been this day directed to comply with your request.

Very respectfully,

ELIHU ROOT,

Secretary of War.

The SECRETARY OF THE TREASURY.

The above order of the Secretary of War related to immigrants arriving from Spain only. Subsequent action was taken providing for the medical inspection of alien immigrants from all foreign countries arriving in Cuba and Porto Rico.

DIVISION OF DOMESTIC QUARANTINE—MARITIME AND INTERSTATE.

MANAGEMENT OF YELLOW FEVER EPIDEMICS—SMALLPOX—TRANSACTIONS AT UNITED STATES QUARANTINE STATIONS—POST-EPIDEMIC DISINFECTION, ETC.

In this chapter I propose first to give an account of the labors of the Service in conducting a post-epidemic disinfection of houses and contents in numerous cities and towns of the South. The labor involved was very great, but it was performed in a systematic manner, and while its preventive effect naturally can not be stated with precision, nevertheless there is no doubt that the work was effective and played an important rôle in preventing or limiting subsequent outbreaks of the yellow fever.

In my annual report for 1898 I gave an account of the post-epidemic measures inaugurated by the Service, including a general order written while the yellow fever epidemic of 1897 was at its height, for the recording of each house in which the fever occurred, and a circular letter addressed at the close of the 1897 epidemic to Marine-Hospital Service officers and State and municipal health officers outlining the plan to be pursued, and in the '98 report it was stated that full reports of this work in detail would be published in the annual report for 1899. I therefore give herewith a report of the post-epidemic dis-

infection performed in the fall and winter of 1897 and 1898 on account of the yellow fever epidemic of 1897, and a report of the disinfection performed in the fall and winter of 1898 and 1899 on account of the yellow fever outbreak in Louisiana and Mississippi in 1898.

REPORT ON POST-EPIDEMIC DISINFECTION FOLLOWING THE YELLOW FEVER EPIDEMIC OF 1897.

By Surg. H. R. CARTER.

Prior to the issue of the Department circular, December 1, 1897, recommending disinfection of premises after the epidemic, disinfection had been undertaken by the Service at Montgomery, Selma, and Greensboro, Ala., and in Franklin, La., and this work had kept so close behind the cases of fever that it was practically complete when the epidemic was done; that at Franklin, indeed, being a main factor in the suppression of the fever. All of this work was done at the request of the municipal health authorities; it was done without any friction, and, I believe, efficiently. Barkley, Miss., had also been disinfected.

The post-epidemic disinfection, however, dates from the order, December 1, 1897, to Passed Assistant Surgeon White, directing him to undertake this work on the Mississippi coast, where it had been requested by the health authorities of the State and the municipal and health authorities of the different places which had been visited by fever. Under this order Dr. White and myself visited the different towns on the coast, beginning with Biloxi on December 7, 1897, to confer with the health officers and make arrangements for this work. The health officers were all very desirous of having this disinfection done, especially so in those towns in which cases of yellow fever were still occasionally occurring. The municipal authorities hoped much from this measure, and the majority of the people, especially those of the more intelligent class, took the same view. There was, however, a considerable number opposed to it, partly because they regarded it as a confession of having had yellow fever in their midst, to which theory no small number of them were violently opposed. Most of the places needing disinfection were unable to bear any material part of the expense on account of the losses incident to fever and quarantine of the fall, and it was evident that if any work were to be done the United States must assume all expense.

In all of the places visited, Biloxi, Pascagoula, Scranton, Ocean Springs, and Bay St. Louis, the same plan of work was agreed on, viz:

First. A recommendation by the health officers to the town council advising the disinfection of all premises in which any fever of any kind, "dengue," "coast fever," "prevailing fever," etc., had occurred that season, especial stress being laid on the disinfection of bedding and packed clothing.

Second. An ordinance by the town council directing this to be done.

Third. An agreement on the part of the Service to bear the expense of disinfection and to pay for any damage resulting therefrom.

The general method of disinfection proposed was as follows:

First, in a place to be chemically disinfected, light fabrics and houses to be disinfected with formaldehyde gas, 5 per cent. released from solution by heat in a proper autoclave. Heavy bedding, mattresses, pillows, quilts, comforts, etc., to be disinfected by steam where possible; where impossible to use steam, to be divided in two classes, those that are without stains and seem clean and new to be exposed to the formaldehyde gas; those stained and dirty, or from other reasons deemed infected in the interior, to be burned. Articles incapable of disinfection to be burned in any case. Great pains to be taken to hang up the articles to be exposed to formaldehyde in single layers on lines in the house. As a rule, the whole house was not to be disinfected, it being impracticable to turn the inmates

outdoors, and the danger being mostly or entirely in the bedding and packed clothing. It had been more satisfactory to treat all heavy bedding by steam, but owing to the opposition which we knew would be forthcoming to allowing these goods to leave the house and to the dampness and occasional wetting in our improvised steam apparatus, we knew it would be impossible to carry this method out in its entirety, and it was believed that the presence of stains on the mattresses and pillows would, in general, be a sufficient indication of infection to allow the superficial disinfection of the unstained by formaldehyde to be sufficiently safe.

At places where general chemical disinfection was impracticable, we agreed to have a general aeration of light fabrics and heavy bedding. The reasons of this distinction in method will be given later. In the first class, places disinfected by chemicals.

In Mississippi: McHenry, Bay St. Louis, Gulfport, Biloxi, Ocean Springs, Scranton, Pascagoula, and Clinton. In Alabama: Mobile, Bay Minette, Flomaton, Wagar, and Whistler. In Louisiana: Lauderdale.

By aeration and burning: In Alabama, Canoe; in Mississippi, Edwards and vicinity and Nitta Yuma; in Louisiana, Franklin and plantations on the Teche around Patterson.

Cayuga, Miss., and Alco, Ala., needed nothing done, and it is a question whether my visit to California, La., resulted in any effective work, and possibly nothing was needed, as aeration was claimed to have been already thoroughly done, and the houses were very open and the place far north. This work was all done at the request of the local, State, and municipal health authorities, and indeed acting as their agents, using only their authority, and was very differently received at different places.

The actual work on the coast was begun at Biloxi, by Dr. White, about the 16th of December, he having as assistants Passed Assistant Surgeon Oakley, Assistant Surgeon Norman, and Acting Assistant Surgeon Geddings. A steam chamber had been improvised out of a refrigerator car, specially fitted up for the purpose, and an engine and crew engaged from the Louisville and Nashville Railroad who, indeed, during the whole of this work, gave us their assistance and most cordial cooperation.

The method of proceeding in detail at those places was as follows: An attempt was made to obtain lists from physicians of all cases of fever other than traumatic which they had treated during the fall and summer, this was supplemented by a house to house inspection to find such cases as had not called in any physician. Owing to the bitterness caused by disputed diagnosis, the physicians' lists proved to be valueless and a house to house inspection had to be relied on.

After this inspection was made, the city council having failed to pass an ordinance requiring disinfection, or if passing it making it without penalty, an attempt was made to obtain the consent of householders to disinfection. At the same time the number of cases, houses, etc., were recorded for reference. The number of householders consenting varied very much in different places, depending in no small degree on the courtesy and tact of the canvasser. Unfortunately the weather proved extremely bad during the month of December and nearly the whole of January, rain and fog occurring most every day. This, with some imperfect working of the steam car, rendered it almost impossible not to have some goods wet, or at least moist when returned. This damage was magnified by the people receiving them, and although all actual damages were promptly paid, yet the result was to greatly diminish the usefulness of the steam apparatus.

After going over the towns and steaming all goods for which consent to use this method could be obtained, we found it advisable to discontinue steaming and rely entirely on formaldehyde and burning for the remainder. The cost of the steam apparatus, in all \$60 a day, was so considerable that it enabled us without extra expense to burn very frequently, and I think but few pieces of heavy bed-

ding that were infected on the inside escaped. Some places, however, as Whistler, Ala., where the inhabitants were very anxious for thorough work, had all fabrics steamed. I doubt if this could have been done had we not had during the disinfection of this place bright, clear weather.

On the 17th of December I visited Franklin, La., and the country around Patterson, where there had been a few cases of yellow fever, and after consultation with the health authority decided on aeration as the most feasible plan to do thorough disinfection in these places.

In Franklin an ordinance was passed by the city council directing aeration on all suitable days, to be determined by the health officer, of all bedding and clothing under penalty, the town marshal being empowered to see that this was carried into effect. The town marshal was appointed by myself sanitary inspector at a compensation of \$60 per month, and was notified by Dr. Foster, the health officer, what days were suitable for aeration. I found on my second visit to Franklin that this work had been most thoroughly and efficiently done; about twenty-four days had been judged suitable, and aeration done at every house where fever of any kind had been reported or found to exist. A house-to-house inspection under the supervision of the marshal was done all over town by the citizens of their own accord. Considerable general sanitary work was also projected here for the winter, cleaning out ditches for drainage, removing rubbish and some old, dilapidated buildings, etc. Near Patterson, there had been no fever in the town, the owners of the plantation where yellow fever had occurred agreed to have this same aeration carried out, the United States bearing what little expense might be attached to this supervision. This was most efficiently carried out. It had previously been treated with sulphur.

The same method of aeration was judged to be more efficient for the places visited in north Mississippi, except Clinton: the reasons being, first, that the houses were too open to be disinfected by gas; secondly, that there was reason to believe there would be sufficient cold and dry weather so far north to furnish safe results, and third, that the work around Edwards was so scattered on the plantations that the expense in both money and time would be very great for the institution of chemical disinfection. This was supplemented, however, especially in Edwards and vicinity, with considerable burning and some sulphur disinfection. The work here was directly under Dr. McCollam, acting assistant surgeon, and was very efficiently done, airing being done in twenty-eight days in the latter part of January and February, and ice forming a number of times during the exposure of the fabrics. In Clinton, Miss., however, the houses being closely clustered together, with a large quantity of bedding and fabrics in them, it was deemed more prudent to rely upon chemical disinfection, which was done under the direct supervision of Passed Assistant Surgeon Oakley, supplemented as usual by a certain amount of burning. Here too, it being a college town and the people generally of a higher order of intelligence, we had the hearty cooperation of the town people, and every house needing it was efficiently disinfected. To take the different places in detail:

Scranton, Miss.—Partial work was done at this place in latter December and early January, working entirely by consent of householders. Afterwards, mainly I believe by the influence of Dr. Dunn, of the Mississippi State board of health, an ordinance was passed requiring disinfection of every house designated by the health officers, under penalty of a fine and imprisonment for each refusal. The work there was most thoroughly done.

Pascagoula, Miss.—There was less, decidedly less, fever here than at Scranton and practically no opposition to disinfection, and the disinfection was done without a special ordinance.

Ocean Springs, Miss.—About two-thirds of the houses of this town were disinfected by consent of their owners, the remainder refusing absolutely to have any

work done. A mass meeting was called by the mayor, and the sense of the community was so overwhelmingly in favor of having the work done completely that an ordinance similar to that of Scranton was proposed. This was due also in no small degree to the influence of Dr. Dunn. There was never any occasion to pass this ordinance, as after this mass meeting those who before had refused gave their consent, and Ocean Springs was disinfected in toto, save one or two houses in which people were sick which were disinfected in early March. A considerable number of houses, about 60, outside of Ocean Springs were included in the Ocean Springs schedule.

McHenry, Miss.—At this place there was some opposition, and there being no municipal authority the work could be done only by the consent of the owners. This was very generally given, however, due probably to the fever having been of a decidedly severe type and continuing well into the winter (January). The place is high, however, and considerably colder than on the Gulf. Some additional risk is probably incurred by it being a "sawmill town."

Biloxi, Miss.—This is by far the most considerable town on the coast, and had, save Ocean Springs, the largest number of cases, and unlike its neighbors, Ocean Springs and Bay St. Louis, is only partially dependent upon its reputation as a watering place, and therefore cared less for its reputation as being free from fever. As practically everybody in the town had been immunized by the fever, and as about half of the physicians in the place and more than half of the inhabitants still believed that the fever which prevailed was not yellow fever, the difficulty of doing thorough work by consent or in any other way was very considerable. To add to these difficulties the weather when the steaming of fabrics was begun was unfavorable for dry work, and the steam apparatus was possibly unfortunately handled. The result was that on the first going over only 217 houses consented to disinfection. Later on, at the request of the town officer and health officer, I wrote a letter setting forth the advantages of disinfection and the slight inconvenience of having the work done. A second and stronger recommendation of the health officer and town council resulted in an ordinance directing disinfection in all houses where fever had existed and imposing a fine on those refusing it. A second attempt was therefore made to disinfect Biloxi. We judged it wiser, however, to proceed with some circumspection, and if possible gain the consent of the inhabitants rather than attempt to enforce this ordinance, which, as it had no alternative penalty to the fine, was practically nonenforceable against the poorer classes, who naturally were the ones who objected most to the disinfection. The work here was slow, troublesome, and costly. The result, however, surpassed my expectation. I am unaware of any fine being imposed, and yet the town was practically disinfected. I inclose copies of letters from the health officers and city attorney bearing on this matter, which I think bear out my statement. Almost every house in town, about 1,000, was disinfected.

Gulfport, Miss.—This is a small place, not incorporated, and had very little fever. The few houses which needed it were disinfected by consent, which, it being dependent on the Gulf and Ship Island Railroad, was readily obtained.

Bay St. Louis, Miss.—The fever here had been very mild, and was not recognized until late in October and, as at Biloxi, was not admitted to be yellow fever by a considerable number of people. This town, however, is dependent on its reputation as a health resort, and although there was no ordinance compelling it the effort to disinfect it met with little opposition, and save four houses it was all disinfected. These were aerated.

Mobile, Ala.—The work at Mobile was begun under my own supervision. After conferring with the mayor and health officers, it was agreed that the United States should supervise the work and pay all expenses save that of unskilled labor, which (at a cost of \$640) the city agreed to furnish. Two physicians, the county health officer being one, were appointed as canvassers to obtain from every physi-

cian in this city a list of his patients with fever, irrespective of kind, attended by him the past season. This was a tedious process, as in not a few cases it had to be written out by the canvasser from the physicians' notebooks. But the physicians generally cooperated with us, and a large number of premises believed to require disinfection were thus obtained. This was supplemented by the lists obtained by a house-to-house inspection and those furnished by the street-car company, Louisville and Nashville, Mobile and Ohio, Mobile and Birmingham railroads, and several other corporations of their employees and members of employees' families who had been sick during the epidemic. Combining all these lists, lists of houses by streets requiring disinfection were made.

The work of disinfection was begun on January 8. This was entirely by consent, the ordinance of the city council being mainly recommendatory. The general method was the same as on the coast. Canvassers were sent around first to obtain consent of householders. This work, requiring much tact and judgment, was at first under the direct charge of Assistant Surgeon Norman. I myself supervised the direct work of disinfection. Later on, when I left Mobile for Edwards and north Mississippi, Dr. Norman took charge of the whole work in Mobile, and to him, especially his canvass, is mainly due that this work was so generally done and with so little opposition. It was completed near the end of February and was a very onerous job.

Whistler, Ala.—At this place are the shops of the Mobile and Ohio Railroad, and practically every one in the town is connected with the railroad directly or indirectly. As there occurred two cases of yellow fever and one death in the latter part of December, the company were very anxious to have the place disinfected and to have it done thoroughly. In visiting the place and meeting a number of the principal people they all agreed to have this done.

Lists of every house in which fever (of any kind not known to be other than yellow fever) had occurred were made up from the records of the physicians and a house-to-house inspection, and the work was done, using steam for all heavy bedding and fabrics, under the supervision of Passed Assistant Surgeon Oakley. Two houses only were omitted on account of sickness (not yellow fever) in them. These Acting Assistant Surgeon Gaines has been directed to attend to from Mobile as soon as practicable. It is worthy of note that beyond causing the color of the cheaper ticking to "run," no damage was caused by this steaming. The damage was of course paid for, the whole place amounting to \$8. As I have said, the weather was fine.

Flomaton, Wagar, and Bay Minette, Ala., were also all visited by myself and arrangements made for disinfection: i. e., lists made of houses needing it and the consent of each householder obtained before the disinfectors began.

There was no trouble, the householders, as well as the health officers, being either willing or desirous for this work. Consent of each householder was necessary, because none of them are incorporated towns.

They were all disinfected, the first two by Dr. Oakley and the last by Dr. Norman. The homes in the adjacent country in which there had been fever were also visited and treated at the request of the owner.

Carnoe, a small place on the Louisville and Nashville Railroad, west of Flomaton, where 2 deaths and 10 cases of yellow fever occurred, but where, I think, it was not officially reported, was visited and reported on by Assistant Surgeon Norman, and such little work as was necessary done subsequently by Acting Assistant Surgeon Geddings by aeration and burning.

In none of these places was there any opposition, save a little at first in Whistler, nor in the places in north Mississippi, in marked and agreeable contrast with Mobile and part of the Mississippi coast.

Edwards, Miss.—This place was aerated, all houses not disinfected by the Mississippi board being so handled systematically by a corps of sanitary inspectors,

under the immediate charge of Dr. McCollum. All bedding, clothing, etc., was hung out of doors every bright, cold day. This place is in north Mississippi, on high land, and it was reasonable to expect sufficient cold and clear weather to render this efficient. Twenty-three such days were so utilized, and I consider the work absolutely efficient.

Nittayuma.—Treated like Edwards, but it is a much smaller place.

California, La., opposite Vicksburg, was visited and the matter talked over with the police jury and the local practitioner, and aeration advised.

Cayuga, Miss., had already been efficiently disinfected by Dunn.

New Orleans, La.—The work of assisting the State board of health in the disinfection and aeration of New Orleans was undertaken at the request of the president of that board under authority of Department telegram of February 11, 1898.

The work here was essentially different from that done elsewhere. All houses in which yellow fever had been reported—about 2,000 cases—had been disinfected by the State board of health. It was known, however, that there had been a large number of cases—estimated at 4,000—not reported. The location of these was unknown to the board, and even if found any attempt to disinfect them chemically would be resisted by the owners.

Under these circumstances it was judged best to attempt a general aeration of this city with such sanitary work as was possible and advisable, and not to attempt chemical disinfection, which indeed was impossible here. This was agreed on, although we recognized that the conditions were not favorable for the best results from this method. The climate here is much damper and warmer than at the other places where it was used, and clear, bright, cold days are far from common. Also, it was late in the year—February—when we began, practically the end of the winter. Still, the winter had been so warm and wet that there seemed reason to hope for cold, clear weather, even as late as this. Again, chemical disinfection being clearly impossible, it was the only method that promised anything, and it was hoped, as entailing a minimum of inconvenience, that it would (or might) be generally carried out by the people and thus accomplish its end if we should get even one more norther. Again, the risk of recurrence seemed so great that any measure which might lessen it was indicated.

Method: The city was divided into districts, and a number of sanitary inspectors were appointed and assigned to districts by squads. The work was put directly under a chief sanitary inspector with a sufficient number of assistant chief sanitary inspectors. These men, as in other towns, worked under the rules of the local sanitary authority—in this case the State board—doing as much in excess of this, where advisable, as the consent of the householders could be obtained to.

The rules under which they worked were agreed to in conference by the president of the board of health, chief sanitary inspector, and myself, and promulgated by the State board. They involved an inspection of every premise in the city, general sanitation of the same, and recommendation of general aeration of bedding and fabrics, and, if possible, disinfection of houses where fever of suspicious nature had occurred, if not already disinfected.

Rules, etc.—It seems that there is no ordinance by which aeration can be enforced, but the recommendation to do it being presented on the same sheet and by the same officers as the directions for the other sanitary measures, which were obligatory and for the nonperformance of which a considerable number of householders were fined, it was hoped would be considered as legally obligatory and that considerable aeration would be done.

I can not say, however, that this part of the work has been successful. The general sanitation, drainage, cleaning back yards, foul vaults, etc., was eminently so, and I believe a certain amount of good has been thereby accomplished. But little aeration, however, has been done, and indeed there has been but little weather suitable for it since it was begun.

A considerable number of houses, although a very small proportion of those

needing it, have been disinfected chemically. I had consulted with the Louisiana board early in December on the expediency of instituting this measure then, but owing to the feeling against this board, which was very general in New Orleans and which had compelled its resignation, it was judged impracticable for it to do more than to recommend aeration in a circular and to do such disinfection as was requested by householders, leaving the general work to their successors, whom we expected to be appointed about January 1. Unfortunately, the new board did not qualify until in February, and although the matter was immediately brought to their attention, the delay, losing nearly all the weather suitable for aeration, is much to be regretted.

To sum up, I would say that in instituting and urging the above measures at any place, I have never claimed that they were necessary. That would imply that yellow fever at that place would certainly recrudescence next summer if these measures were not taken.

They have been urged, however, as very advisable, that is, that yellow fever was liable to recur if they were not used, and that this liability was lessened in direct proportion to the thoroughness with which these measures were carried out. In several places we can not say that they were carried out with absolute thoroughness, and the most that we can say for these places is that the factor of safety has been increased by our work in proportion as it has been done.

I will add that, taken altogether, it was the most disagreeable and harassing work I have ever been engaged in.

POST-EPIDEMIC DISINFECTION FOLLOWING THE YELLOW-FEVER OUTBREAK OF 1898.

It will be remembered that in 1898 yellow fever was reported in but two States—Louisiana and Mississippi—there having been, to November 1, 51 deaths from this disease in Louisiana and 63 in Mississippi. The cases, however, were distributed in a number of different localities. (See Annual Report for 1898, p. 557.) The measures adopted in post-epidemic disinfection, during the fall and winter of 1898–99, are fully indicated by the following letters and inclosures:

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
New Orleans, La., October 28, 1898.

SIR: About the post-epidemic work, I would say that I think there should be a regular systematic effort at disinfection made of all places—certainly all places south of the Louisiana and Mississippi line east of the river. This can be done, I believe, best and most efficiently by aeration. I say most efficiently because practically all the houses in town and their contents can be thus treated, while chemical disinfection will not be allowed in more than 50 per cent of houses. The result then will be better than by aeration. I have already begun this work in St. James, made arrangements for the same in Franklin, and Clarke has gone to Litcher on this errand to-day. This place will probably require some chemical work, and he and Dr. Lumsden go there Monday. It is a sawmill town and therefore a dangerous one.

This work, aeration, can mainly be done by the local health officers, under advice, etc., and occasionally expense of this Service, and will be little costly. Independently of this, however, it is efficient.

Respectfully, yours,

H. R. CARTER,
Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,
Washington, D. C.

[Inclosure—Circular.]

BOARD OF HEALTH, CITY OF NEW ORLEANS,

New Orleans, La., November, 1898.

The board of health is now engaged in the thorough application of such preventive measures as are considered effective in destroying whatever infection has remained from the visitation of fevers experienced during the past summer.

These efforts will necessarily be confined to within limits too narrow to include every possible source of danger, unless the willing and active assistance of our people is given to those in authority.

Those premises, only, which are known or believed to have been subjected to infection are likely to receive attention at the hands of the sanitary officers.

It is not unreasonable to suppose that during a visitation of a disease which was, as a rule, so mild in character as that through which our community has just passed, there must have been many cases of fever which were so devoid of characteristic symptoms as to have remained unclassified; and many cases there must have been which did not receive or require medical attention.

While it can not be asserted with any degree of certainty that these cases were yellow fever, it is highly probable that some, at least, of these were unrecognized cases of this disease, and the danger of a recurrence next summer may be looked for partly from this source; and although the possibility of a recurrence may be thought to be remote, the measures of prevention suggested are so simple and easy of application, and at the same time so efficacious, that not a single household should allow the opportunity to pass without giving them a thorough trial; and whether there has been fever in a house or not during the past summer, the general benefit derived from a thorough airing of premises should be sufficient reason for its universal adoption.

It is a well-known fact that sunlight and oxygen destroy germs of disease. In the case of yellow fever, cold is a potent factor in such destruction.

Let us, then, give nature a chance during the present winter to destroy with her own inexpensive agents any possible remaining vestige of infection left over from the summer.

Let our houses be thrown open on every cold and clear day as much as is practicable, more especially the bedrooms.

Let the clothes and bedding, curtains, and all woolen, linen, and cotton materials be frequently aired and sunned. And most particularly let the clothes worn during the past summer be frequently subjected to the disinfecting influences of cold fresh air and sunlight.

Trunks, chests, armoires, closets, and bureau drawers should be opened and emptied of their contents during cold and clear weather; and fresh, cold air should be permitted to circulate in the remotest corners of the house among articles which can not be removed to the sunlight.

If this be done in every house sufficiently often, say three or four successive days in every week (longer would be better), selecting the coldest and driest weather, as far as possible, we may assure ourselves that we will not have a recurrence next summer of the misfortunes through which we have just passed. And if we expend the same amount of energy during the present winter in preventive measures, as was so generously contributed during the summer of 1897 in sanitary efforts, we will very certainly do much more effective work than was possible at the time we were most anxiously active.

Now is the time to apply the ounce of prevention, which is worth more than the pound of cure.

Respectfully,

QUITMAN KOHNKE, M. D.,
Health Officer.

REPORT OF SURGEON CARTER ON POST-EPIDEMIC AERATION AND DISINFECTION.

WASHINGTON, D. C., *November 28, 1898.*

SIR: Replying to your letter of the 25th instant, directing me to report what measures of post-epidemic disinfection have been put into operation, either by the State or local authorities or by myself, I have to state as follows:

The circular herein inclosed was sent by myself, with the concurrence of the Louisiana State board of health, to the health officers of all places in the State where yellow fever was reported this past summer and fall, and to a number of other places where fever possibly existed without being reported. A circular letter (inclosed), with additions appropriate to the circumstances of each place, was sent to such health officers of places where fever had prevailed, as I know personally, which, indeed, included about all in Louisiana. The president of the Louisiana State board of health issued a similar circular (a copy of which is also inclosed) which was sent, I am informed, to all physicians registered in the State. The president of the New Orleans city board of health also issued a circular for general distribution in that city. (Copy inclosed.) I will say that our conjoint action was taken after conference.

In addition, another officer of the Service, Assistant Surgeon Clark, and myself have visited nearly all the places in Louisiana in which fever was reported, to make personal recommendations and arrange for the systematic carrying out of aeration as set forth in the circular letter above mentioned. This itinerary will be completed. Some places in Louisiana which seemed especially to need it, as Litcher (a sawmill town) and a portion of Wilson, have been disinfected chemically by the Service with sulphur, formaldehyde, and bichloride of mercury, and by the destruction of possible fomites, and general sanitary work such as ditching, draining, removal of sawdust piles, foul privies, etc. Similar work was laid out by myself at Bowie, another sawmill town, but is being carried out by Dr. Storck under the local authorities.

The systematic aeration in Louisiana is being done very efficiently in the towns in which it has been instituted. In Franklin and Houma, in the sugar districts, it seemed inadvisable to institute it on a complete scale until after the sugar-grinding season, about the 1st of January, as up to this time all male members of households are engaged in this industry. Representations have been made to the president of the Louisiana State board of health and to the city health officer of New Orleans urging that the same systematic aeration should be instituted in New Orleans as is taking place in other places in Louisiana. I deem it very essential that in New Orleans, as in other places, this aeration be directed by ordinance and carried out systematically and efficiently by the proper inspectors.

In Franklin and Harvey's Canal, and possibly at some other points, it will, I believe, be necessary for the Service to assume charge with the health officers and bear the expenses of this work, which, however, will be very slight.

The secretary of the Mississippi State board of health writes me that, in addition to some chemical disinfection which has been and will be done in his State, for which, in Jackson, I furnished certain apparatus and material, as per your verbal order, he has made a general recommendation of aeration of infected places on the lines of the circular which I inclose.

In addition, the infected towns in north Mississippi—Oxford, Water Valley, Taylor, and Orwood—have been disinfected chemically under the direction of P. A. Surg. J. O. Cobb, either during or since the close of the epidemic.

The town of Harriston has, by the Mississippi board, also been disinfected chemically, and considerable disinfection (all that is needed) has been done, the Service instituting it and furnishing material at Lambertson, Miss.

The reason why this method of aeration is favored in preference to chemical dis-

infection are, I think, fully set forth in my letter of October 28, 1898, herewith inclosed. If carried out, and in proportion as carried out, it will be efficient.

Respectfully, yours,

H. R. CARTER,
Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure No. 1.—Circular letter.]

UNITED STATES MARINE-HOSPITAL SERVICE,
New Orleans, La., October 29, 1898.

DEAR DOCTOR: I send you a little circular, mailed also generally to the places where there has been fever.

In general the white people, when the importance and efficiency of this measure is explained to them, and it is both, will carry it out voluntarily and at intervals during the winter.

With the negroes and certain classes of whites this will not be done, and what I would suggest, and what has been done in previous years, is that a town ordinance be passed directing this aeration "on such days as directed by the health officer." Appoint a man—generally town marshal—to see that it is carried out. Divide up the town into so many districts as may be necessary. Assign each one to a man, subordinate to the marshal, with police authority. Whenever proper weather occurs (we can generally tell the night before) let the health officer notify the marshal and the men go around and notify the householders. Go around again next morning and subsequent mornings and see that it is carried out. In a small place this plan has worked perfectly. In a large one it gives a large percentage of aeration.

It is, of course, only necessary to aerate the houses in which fever has occurred. A general aeration of fabrics, however, in bright weather, is an excellent hygienic measure, and will catch doubtful cases. Chemical disinfection, steam, formaldehyde, sulphur, or bichloride, as needed, will be furnished by the Service to any place (house or houses) which seem to especially require it, and either myself or Dr. Clark, assistant surgeon, will visit you to confer on this matter as soon as possible.

Respectfully, yours,

H. R. CARTER,
Surgeon, M. H. S.

[Inclosure No. 2.—Circular.]

LOUISIANA STATE BOARD OF HEALTH.

Recommendations to housekeepers.

NEW ORLEANS, *November 4, 1898.*

1. The greatest danger of recurrence of disease lies in the houses, and especially in the bedding, clothing, bureaus, trunks, boxes, etc.

2. Hence the utmost importance for people in whose houses fever of any kind has occurred to apply most rigorously, in spirit and in letter, the following recommendations:

3. All bedding, upholstered furniture, and especially packed clothing, should be taken out of doors and spread in the sun and wind.

4. This should be done in bright, clear, cold weather.

5. A single airing is not generally sufficient.

6. The house should at the same time be thrown open as far as possible.
7. It is better to be without fires, but it is better to have fires and keep the house open than to be without fires and shut up the house.
8. When practicable, leave bedding, etc., out during cold nights, but this is not essential.
9. Pay special attention to clothing, bedding, etc., packed away in trunks and boxes.
10. The armoirs, bureaux, boxes, trunks, etc., should be opened, and contents spread out as above indicated.
11. This should all be done six or seven times in succession, if possible.
12. The yards, alleys, etc., must be kept thoroughly clean and drained.

EDMOND SOUCHON, M. D.,
President Louisiana State Board of Health.
 H. R. CARTER,
Surgeon, U. S. M. H. S.

DISINFECTION BY AERATION IN NEW ORLEANS.

TREASURY DEPARTMENT,
 OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, December 30, 1898.

SIR: On December 19 the following telegram was received from Surgeon Carter at New Orleans:

"The board of health proposes to make a house to house inspection of New Orleans to determine where yellow fever existed. They will then compel these houses disinfected by aeration. The assistance of the service is asked. Can I give needed help? It will take about fifteen thousand dollars. I would recommend it. Letter by mail. The work is the same kind as was done in other places last year."

The letter referred to in the above telegram was received by me December 28, and the same day the following telegram was sent to Surgeon Carter:

"Have seen Secretary concerning expenditures in New Orleans. He wishes to know what expenditures will be borne by the local authorities. If agreement can be obtained with the board of health to obtain and give prompt notice to our officers in the event of any appearance of yellow fever, believe request will be favorably considered. Have awaited your letter of twentieth. It reached me this morning."

In response to my telegram to Surgeon Carter I received the following from him December 29:

"Board of health will obtain and arrange lists of infected houses needing treatment from physicians and inspectors and do about one-third of the work of inspection. Board will report yellow fever as soon as it knows of its existence and will make every exertion to discover it."

In addition to the above the Bureau has received a letter from Hon. Adolph Meyer, M. C.: a letter from S. Locke Breaux, president of the New Orleans Board of Trade, and an indorsement by Senator McEnery on a letter addressed to him by the president of the board of trade, these said letters and indorsements urging the compliance of the Marine-Hospital Service with the request made.

I have the honor to inform you that the Bureau, with the approval of the Secretary of the Treasury, has instructed Surgeon Carter to render assistance in accordance with the prescribed methods of the Treasury Department and in accordance with the assurances given by the board of health to him and forwarded by him to the Bureau, as set forth in his telegram of December 29 above quoted.

I have respectfully to request that you will acknowledge receipt of this letter, which acknowledgment will be considered confirmatory of the understanding herein set forth.

Respectfully yours,

WALTER WYMAN,
Supervising Surgeon-General M. H. S.

Dr. QUITMAN KOHNKE,

President New Orleans Board of Health, New Orleans, La.

In accordance with the understanding as set forth in the above letter, aid was given to the city of New Orleans under the direction of Surg. H. R. Carter, on whose recommendation some 67 men were appointed and employed by the Marine-Hospital Service in New Orleans during the months of January and February, 1899, at a cost of \$6,202, a circular at the same time being issued by the board of health of the city urging householders to give a thorough airing to their premises and contents in cold and clear weather.

THE VALUE OF POST-EPIDEMIC DISINFECTION ILLUSTRATED BY RE-
CRUDESCENCE OF YELLOW FEVER FOLLOWING DISMANTLING OF OLD
BUILDINGS.

The attention of health officers of the South was called to the danger of dismantling yellow fever infected buildings during the quarantine season by means of the following letter published in the Public Health Reports. The facts therein set forth appear to illustrate the wisdom of post-epidemic disinfection as well as the danger in tearing down houses once infected that have not been disinfected.

OFFICE OF SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., May 3, 1899.

SIR: I desire to invite your attention to a matter which is of very considerable sanitary importance, namely, that no old buildings which have once been infected with yellow fever should be allowed to be dismantled in summer. You will possibly remember that there is reason to believe that the epidemic of yellow fever in Franklin, La., during last year originated in the dismantling of a building which had been infected the previous year. A further case in point may be cited in the dismantling of an old barge in the harbor of Habana. (See p. 608, Public Health Reports No. 17, dated April 28, 1899.) With the strong probability of such happenings in mind, the Bureau, in the spring of 1898, refused to sanction the dismantling of the cruiser *Buffalo*, formerly the Brazilian cruiser *Nietheroy*, at Newport News, Va. Both the Franklin and Habana incidents show very conclusively the wisdom of this latter named decision, and it is therefore believed that it would be a very wise precaution should all the States of the South forbid the dismantling of such old buildings at any time between the 1st of April and the 1st of November.

Respectfully yours,

WALTER WYMAN,
Surgeon-General U. S. M. H. S.

Dr. EDMOND SOUCHON,

President State Board of Health, New Orleans, La.

NEW ORLEANS, *May 6, 1899.*

SIR: I have received your letter of May 3, inviting my attention to the importance of not allowing old buildings which have once been infected with yellow fever to be dismantled in summer.

I will send a circular letter to all of our health officers, parish and municipal, to that effect.

Yours, very truly,

EDMOND SOUCHON, M. D.,
President Louisiana State Board of Health.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

The danger above alluded to received strong confirmation from the following extract from a report of the United States consul at Vera Cruz received in June, 1899, showing that the epidemic of yellow fever then prevailing in Vera Cruz appeared to be traceable to a general remodeling of the houses. Following the extract from the letter of the consul is a report from the sanitary inspector of the Marine-Hospital Service at Habana, showing a like spread of infection due to the dismantling and reconstruction of an infected barge in the Habana Harbor.

[Extract from letter of United States consul.]

Early in the spring of last year the city council passed a resolution to have owners of property comply with an ordinance then existing to repair and fix up buildings in the city, to have them clean up, repair, and whitewash their buildings. Most of the owners preferred previous to doing so to make such general repairs and alterations as were needed, hence they commenced to take out partitions, break down entire walls, remove roofs, etc., and coral rock, brick, stone, plaster, roofings, and débris was everywhere piled up in the streets in front of the houses being repaired. Since then there has not been in this city a street where one or more buildings were not undergoing a general repair. It was then that yellow fever made its appearance, and as the work progressed the fever increased, until it is now an epidemic.

[Letter from the sanitary inspector M. H. S. at Habana.]

HABANA, CUBA, *April 18, 1899.*

SIR: The following report of the inspection of the British steamship *North Anglia* is respectfully submitted. This vessel arrived here on Monday, April 3, with a cargo of coal from Philadelphia, Pa., went to a berth at Casa Blanca to discharge her cargo the same day, and was placed at the head of 2 piers, the bow being made fast to one, the stern to the other.

On Wednesday night, April 5, the captain was taken sick with what was not diagnosed by either Dr. Dudley or myself as yellow fever, and died Friday night, April 7, the duration of his illness being less than forty-eight hours. An autopsy conducted by Surgeons Carter and Wasdin, Past Assistant Surgeon Geddings, Sanitary Inspector Dudley, Acting Assistant Surgeon Menocal, and myself, demonstrated the lesions of yellow fever. At the same time the steward of the vessel was examined and found with the disease.

The weather being cold and disagreeable, a removal of the steward would have caused his death, and he was isolated where found, in the cabin, and after the discharge of a few tons of coal from her hold she was removed from the piers and placed in quarantine.

Yesterday the steward having so far advanced in convalescence as to be removed, and yet not able to continue with his vessel, he was sent ashore. The cabin and its contents were disinfected, and the vessel proceeded this morning to Santiago de Cuba, there to discharge a small, general cargo, before proceeding to Baltimore. It will be noted that the cabin alone was disinfected, and for the following reasons: When lying at the piers the infection was a result of the following condition: Along side the pier to which the stern was made fast and within a few feet of the captain's stateroom, in the cabin, was an old bark, which had been lying in this harbor for about two years, dismantled and condemned, and which was being reconstructed into a barge; this work necessitating the removal of her decks. Much of her woodwork was rotten, and had been thrown on the pier head under the ports of the cabin, and it is evident that this material was the focus of infection. The persons attacked were master and steward, both living in the cabin.

None of the engineers living amidships were attacked, nor were the sailors or firemen in the forecabin. The steward was isolated on the 8th instant, and the vessel developed no more cases up to her leaving to-day, 18th.

A certificate of her disinfection, with data of her infection on bill of health, was given vessel. The barge referred to has been removed from wharf by reason of my prohibiting it from being used until it and the infected wood and barge were taken away.

Very respectfully,

W. F. BRUNNER,
Sanitary Inspector, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

QUARANTINE SAFEGUARDS ENFORCED IN CONNECTION WITH 30,000 TROOPS RETURNING FROM CUBA AND PORTO RICO.

Following the termination of hostilities with Spain, the return of the troops from Cuba, where it was known positively yellow fever had prevailed among them to a considerable extent, and where to a much greater extent other fevers had prevailed whose identity with yellow fever was at least suspected, was viewed with marked apprehension by quarantine and State health officers, and called for active measures to prevent the introduction of infectious disease. Moreover, without the measures put into operation by the Marine-Hospital Service the restrictions which would have been placed upon the movement of these troops by State and local quarantines, acting within their legal jurisdiction, would have seriously interfered with the efforts of the War Department for the prompt return and discharge of the volunteers. In all more than 30,000 troops were inspected at quarantine by officers of the Marine-Hospital Service. A large proportion of them were detained in quarantine for a period of five days, 10,000 being detained in the quarantine detention camp on Daufuskie Island (Savannah quarantine) alone.

In March and April, 1899, the camp equipage, baggage, and effects, amounting to upward of 18,000 tons, of the returning soldiers were disinfected at the quarantine stations. The greatest part of the work was accomplished at the Savannah quarantine station and its annex, Daufuskie Island, but important work was also done at South Atlan-

tic, Tortugas, Egmont Key, and Tampa Bay quarantines. By arrangement of the Bureau with the Quartermaster-General's Office in Washington, cable information from the quartermaster at Habana was received concerning the proposed sailing from any port in Cuba of any transport bearing troops, and the port to which it was advisable to send the transport was indicated to the Quartermaster-General and by him transmitted to his officer in Cuba before the departure of the vessel. By this arrangement undue crowding of any one port was obviated.

The Bureau spared no pains to have every quarantine ready, and instructions were sent to all by telegraph regarding water supply, tentage, and disinfectants, that all might be prepared.

At one time during March, 1899, the total available supply of one disinfectant in New York was purchased.

A steam disinfecting chamber en route to Cuba was diverted at Tampa and sent to Savannah, Ga., to supply a deficiency.

I take this opportunity to express appreciation of the hearty cooperation and assistance rendered by Quartermaster-General Ludington and his assistant, Col. Charles Bird, in charge of the transport service, and of Col. J. B. Bellinger, whose support and activity at Savannah greatly aided in the successful execution of the Service work. In the main the restraints were cheerfully borne by the returning troops; but attempts were not wanting to evade or override the quarantine regulations, but these attempts, so far as known, were none of them successful.

The commander of the troops arriving at one quarantine station (Tampa Bay), impatient at the delay caused by the necessary disinfection of the baggage, replaced the same on board the transport and sailed for Port Tampa, the landing point, in violation of the regulations. The Bureau was immediately notified by wire, and the Acting Secretary of War, on my request, immediately telegraphed this officer to return the baggage to the quarantine station for compliance with the regulations, the railway company was notified that to transport this baggage would be a violation of the United States quarantine law and subject them to penalty, and the collector of customs was directed to refuse entry to the vessel. The Marine-Hospital Service officer at Port Tampa was directed to meet the vessel on arrival to see that the regulations were carried out. The baggage was duly sent back to quarantine and disinfected. Another army officer in command of troops wired to the President that his troops needed the clothing which was undergoing disinfection to protect them from the cold, and requested his action. It developed, however, that additional clothing from the quartermaster's stores had been tendered this officer by the quartermaster at Savannah and the offer declined.

The effort was apparently one to evade the quarantine regulations and was without effect.

Two companies of troops were given permission to pass through one of the Southern ports with baggage not disinfected, with certain provision regarding the handling of the baggage and their immediate departure, this under a misapprehension that they were going direct to a Northern point, but on receiving telegraphic information at the Bureau measures were taken and put into effect to prevent the landing of the baggage without disinfection. This was done. As illustrating the widespread interest in these measures, and the fact that the Service had anticipated public opinion, the Bureau was almost immediately in receipt of telegraphic protests against this exception from several State and municipal authorities, including the governor of one State.

The quarantine surveillance of returning troops from Cuba began with the first troops from Santiago to Montauk Point, Long Island, New York. The details and orders connected with the establishment of this quarantine are described on pages 686 and 692 of the Annual Report of 1898. The report of the medical officer in command of the Montauk Point quarantine follows:

QUARANTINE PRECAUTIONS AT MONTAUK POINT, N. Y.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,
Memphis, Tenn., January 11, 1899.

SIR: I have the honor to make the following report of the quarantine established at Camp Wikoff, Montauk Point, New York, in obedience to your order and maintained from August 13 to September 15, 1898, to prevent the introduction of quarantinable disease into the United States on the return of the army of invasion from Santiago de Cuba.

The cooperation of the general commanding at Wikoff was secured by the following order from the Secretary of War:

WASHINGTON, D. C., *August 11, 1898.*

General YOUNG, *Montauk Point, N. Y.*

The Secretary of War directs that you cooperate with Surgeon Magruder, United States Marine-Hospital Service, to establish and fix quarantine grounds and anchorage for transports bringing in General Shafter's command to Montauk Point. As each transport arrives the quarantine officer will board it and raise the yellow flag and make personal inspection of the troops on transport. If no yellow fever cases are found, the sick will be removed to general hospital and the well to detention camp, where they will be held from three to five days, then removed to general camp. If any yellow fever cases are found, they will be taken off and either put aboard the sanitary barge or put in yellow fever hospital. Other sick will be moved to the general hospital and the well detained in detention camp from eight to ten days. No person will be allowed aboard a transport while the yellow flag is up without written pass of Surgeon Magruder. A revenue cutter has been ordered to Montauk Point to enforce sanitary quarantine regulations.

H. C. CORBIN,
Adjutant-General.

The site chosen by the War Department for the location of its camp among the grass-covered hills of the eastern end of Long Island, with its porous soil of loose sand and gravel, its delightful climate at this season of the year, its distance from

populous centers, and the ease with which it can be isolated from the world, if necessary, affords, aside from the possible difficulty of maintaining a pure-water supply, conditions almost ideal for the encampment and quarantine of an army presumably infected with yellow fever. Conditions so favorable, in fact, that did we not recall the fatal outbreak of yellow fever which occurred on Block Island, only a short distance away, in the year 1801, one would almost be led to believe that yellow fever could not exist in a spot so favored.

On the eastern shore of Fort Pond Bay, a wharf suitably located for quarantine purposes had been secured by Passed Assistant Surgeon Kinyoun, who reached the ground on the day preceding my arrival, and on the shore adjacent to this the headquarters of the Service were established. A boat house and a number of tents were used as quarters for officers and men, and a detail of troops from the Ninth Cavalry was placed on picket duty to prevent intercourse between quarantine and general camp. Nine medical officers, 3 hospital stewards, and 20 attendants were sent from the different stations of the Service to aid in the work. The *Protector*, a disinfecting barge, designed and built by the Service for use at one of its Southern stations, and fully equipped with the most modern disinfecting machinery and appliances, was sent in tow from Philadelphia, and arrived in good time. A quarantine anchorage, 1 mile square, was marked by 4 bouys to the westward of Rocky Point, and $2\frac{1}{2}$ miles from the quarantine wharf. Two armed cruisers from the auxiliary navy were employed on patrol to prevent communication with vessels quarantined; a revenue cutter was sent from the New Bedford station for any duty for which she might be needed; a tug, for boarding purposes, was supplied by the War Department with 2 barges, used in connection with the *Protector* during the disinfection of ships. These vessels, with the occasional use of an additional tug, composed the quarantine fleet, and thus was established, in a period of time incredibly short and on a coast almost destitute of all facilities and conveniences, a modern quarantine, fully equipped and prepared to meet an emergency of unusual gravity and magnitude.

The first transport entered the bay August 13, and for the next two weeks they arrived at the rate of from 1 to 6 per day. Each vessel, on arrival, was immediately boarded, the sick were examined by Acting Assistant Surgeon Brunner, an expert in the diagnosis of yellow fever, and the remaining troops were drawn up on deck in open order, and were inspected by medical officers who held, for subsequent examination by Dr. Brunner, any individual presenting symptoms at all suspicious. If the vessel was free from infection, the chief of the transportation department was notified and the troops were landed and conveyed to hospital and camp as rapidly as possible; if infected, the sick were landed at once and isolated by the War Department; and the remaining troops, after being bathed, were given new clothing and placed in detention camp, and their old clothing steamed or treated with formaldehyde; the crew of the ship was likewise bathed, and clothing and vessel thoroughly disinfected and held under observation the required period.

Two vessels arrived with infection on board, the *St. Louis* and the *Grande Duchesse*, the former having lost one man with black vomit eight hours before her arrival, and the latter vessel with two cases of yellow fever. One additional case developed on the *St. Louis* on the sixteenth day, but further than this the disease did not spread, and no subsequent cases occurred on board or in camp. These vessels were disinfected under the immediate supervision of Passed Assistant Surgeon Kinyoun, who will make a special report describing the barge *Protector* and his method of disinfection. I need make no comment on this subject further than to say that the 1,203 troops and crew were bathed and their clothing disinfected in two days, and in two more the disinfection of the ships was completed. I know of no instance in which a vessel as large as the *St. Louis*, and having so many persons on board, was disinfected in so short a time.

The following list gives the names of all transports and vessels bringing troops, dates of their arrival, and number of troops on board:

Name of vessel.	Date of arrival.	Troops on board.	Sick.	Deaths on voyage.	Condition of vessel.
Gate City	Aug. 13	551	41	.....	Not infected.
Vigilancia	Aug. 14	699	21	.....	Do.
St. Louis	do	872	24	1	Infected.
Miami	do	680	34	1	Not infected.
St. Paul	Aug. 15	1,113	89	.....	Do.
Grande Duchesse	do	1,143	224	.....	Infected.
Matteawan	do	527	70	1	Not infected.
Seneca	Aug. 18	416	73	.....	Do.
Comanche	do	488	114	.....	Do.
Mobile	do	1,600	300	10	Do.
Rio Grande	Aug. 20	636	30	1	Do.
Breakwater	do	345	50	1	Do.
Olivette	Aug. 21	275	192	8	Do.
City of Macon	do	462	92	2	Do.
Mortera	do	312	20	.....	Do.
Leona	Aug. 22	528	104	1	Do.
Resolute	Aug. 23	688	61	.....	Do.
Badger	do	186	82	.....	Do.
Arcadia	do	185	27	.....	Do.
Yale	do	1,069	178	1	Do.
Mohawk	Aug. 24	1,199	130	2	Do.
Harvard	Aug. 25	670	33	1	Do.
D. H. Miller	Aug. 26	376	20	.....	Do.
Yucatan	do	486	110	4	Do.
Hudson	do	514	95	1	Do.
Catania	do	461	50	9	Do.
Santiago	do	489	124	2	Do.
Prairie	do	214	99	.....	Do.
Minnewaska	Aug. 28	816	49	1	Do.
Specialist	Aug. 30	118	20	.....	Do.
San Marcos ¹	do	397	5	.....	Do.
Berlin	do	886	150	1	Do.
Panther	Aug. 31	106	15	1	Do.
Allegheny	do	480	145	14	Do.
Mexico	Sept. 1	62	3	.....	Do.
City of Washington	do	4	.....	.....	Do.
Berkshire	do	348	3	.....	Do.
Orizaba	Sept. 2	24	.....	.....	Do.
Nueces	do	348	28	.....	Do.
Unionist	Sept. 4	86	.....	.....	Do.
Roumanian	do	600	100	7	Do.
Missouri	Sept. 10	249	249	13	Do.
Saratoga	Sept. 11	312	28	2	Do.
Vigilancia	Sept. 13	224	70	2	Do.

¹ Ninety-four sick landed at New York, en route to Montauk Point.

In addition to the troops aboard the *St. Louis* and *Grande Duchesse*, the clothing of 48 nurses arriving on the *Vigilancia*, whose destination was New Orleans, and of 207 stevedores on board the *Saratoga* and bound for Charleston, was disinfected.

Troops aboard the *Missouri*, *Berkshire*, *Roumanian*, and *Catania*, composed in great part of convalescents (many from yellow fever) from the hospitals at Siboney, were not disinfected, there being no case of yellow fever on board, and the chief surgeon aboard stating in each case that each individual had been bathed and given clean clothing before leaving Cuba, in accordance with the order of the Secretary of War.

The work of boarding and inspecting transports was performed rapidly and without hitch. Most of them were boarded within a few minutes after entering port, and a longer delay was occasioned only where they arrived overnight or several in company. Owing to insufficient wharf facilities, the landing of the troops by the transportation department was oftentimes considerably delayed. To avoid the additional hardships which such delay entailed to the sick, a transfer boat was provided, and they were immediately brought ashore and sent to the hospital, where they could receive better attention and the surroundings were more comfortable.

As will be inferred from the above, the work of the Service ceased when the

troops were brought ashore. At one time it was proposed to place the detention hospital in charge of officers of the Marine-Hospital Service, but to avoid complications which threatened and to prevent the unsatisfactory and inefficient work which too often attends division of authority, it was considered best to adhere rigidly to the letter of your original order, directing that my authority over troops and vessels should terminate when the yellow flag was hauled down. By pursuing this course the work proceeded without friction or unpleasant incident, and the generals commanding (Generals Wheeler and Young) were disposed to aid and support me in every way possible.

Respectfully, yours,

G. M. MAGRUDER,

Passed Assistant Surgeon, M. H. S., in Command.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

In March, 1899, the Quartermaster's Department made known to the Bureau the determination of the President to return to the United States before the onset of the rainy season the remainder of the troops in Cuba and Porto Rico no longer required there for military purposes. Accordingly preparations were made at the quarantine stations, as heretofore mentioned, and the following communication was sent to the Quartermaster-General's Office:

TREASURY DEPARTMENT,

OFFICE SUPERVISING SURGEON-GENERAL, M. H. S.,

Washington, D. C., March 6, 1899.

SIR: The following is a copy of a quarantine order sent to every quarantine station in the South on March 4:

"All baggage and effects of soldiers from Habana and Cienfuegos must be disinfected prior to vessel's entry. This regulation takes effect at once. Soldiers' baggage and effects from all Cuban ports must be disinfected after March 15.

"By direction of Secretary of the Treasury:

"WYMAN, *Surgeon-General.*"

Respectfully yours,

WALTER WYMAN,

Supervising Surgeon-General, M. H. S.,

Col. CHARLES BIRD, U. S. A.,

Quartermaster-General's Office, War Department.

As previously stated, the chief port of disembarkation was Savannah, where at first the operations of the Service were conducted through Assistant Surgeon Foster, who was in charge of the Marine-Hospital Service at that port. It became necessary, however, to quickly enlarge the force, and the following organization was promptly effected:

P. A. Surg. J. O. Cobb was the Service representative, with headquarters in Savannah, where he kept in touch with Colonel Bellinger, quartermaster in charge of transportation at that port. P. A. Surg. A. C. Smith, with four acting assistant surgeons, was detailed for duty at the local quarantine in charge of the disinfection, and Asst. Surg. R. H. von Emdorf was placed in charge of the detention camp on Daufuski Island to carry out the regulations pertaining to the detention of persons in quarantine.

The following reports by these officers will give a clear idea of the services rendered:

REPORT ON QUARANTINE OF TROOPS AND DISINFECTION OF THEIR BAGGAGE AT SAVANNAH, GA.

By P. A. Surg. J. O. COBB.

SAVANNAH, GA., *April 13, 1899.*

SIR: I have the honor to report briefly upon the present operations by officers of the Service in the disinfection and detention of soldiers and army transports.

To give us status and power to enforce our temporary regulations I asked the mayor to furnish me with a written order to his quarantine officer, Dr. Linley, informing him that the Service had been requested to take charge of the disinfection of transports and troops. Dr. Foster had already instituted a method for handling men and baggage, which was continued by Dr. Smith. Dr. Foster's plans were excellent and showed good judgment. All that was needed was more assistance, as the work was too much for one man. Colonel Bellinger has given us every aid that lay in his power, and not one thing that I have asked him to do or furnish has been refused. Furthermore, he has shown a remarkable intelligence in dealing with quarantine. All that has been necessary to obtain his prompt cooperation was a concise explanation, and our suggestions and regulations were expeditiously carried out.

The handling of troops on Daufuski Island was presented at a time when it looked as if no suitable or safe place could be found near Savannah. The island is about 6 miles east of Savannah Quarantine Station, on the South Carolina side. The eastern end of the island is settled with farmers and fishermen. Near the western end of the island is a marsh strip running well across. There are no houses near this place. The western end of the island (800 acres) is used for the encampment. A provost guard line of regulars completely closes in the encampment from the land side, and there is a guard at the wharf and no person whatsoever is allowed to enter the sentry line. No person can enter the line, not even myself, or leave without a written order from Dr. Von Ezdorf. Inside the guard line are two houses, about half a mile apart. The house farthest away is used for a regimental hospital. The one near the wharf is isolated from the general camp by guards and is used for quarters by Dr. Von Ezdorf, the army surgeon, and the quartermaster in charge. This will be the office, and here Colonel Bellinger and Surgeon-Colonel Greenleaf have been permitted to go and hold daylight communications with officers in the camp. Neither of these gentlemen goes inside the encampment.

The sanitation of the camp itself and the treatment of the sick, of course, are carried out under instructions from Colonel Greenleaf and according to regimental routine. Dr. Von Ezdorf has been directed to treat any suspicious case or actual case of yellow fever if he were asked, but if not asked he is nevertheless to visit the case and report daily.

The guard line and the enforcement of detention are under Dr. Von Ezdorf's supervision, and he rides around the lines and through the camp several times a day. He sees the sick by courtesy, and his status is now fully established. He keeps the dates of arrival and discharge of troops, taking the company records for such information as to numbers, etc. Civilians, discharged employees, and stragglers traveling with the regiment give us the most trouble. These he deals with by recording the name of each.

The method of discharging a regiment is as follows: It takes two hours for a lighter to go to town, and this time completes the period of detention. Dr. Von Ezdorf informs the quartermaster-captain in charge at Daufuski on the day the regiment completes its detention. This officer then makes his arrangements for transportation. The lighters are brought by tugs and the companies are marched to the wharf. At the wharf each company falls into line and the roll call is made, Dr.

Von Ezdorf counting by fours and comparing the "field report" and "sick report;" they then pass onto the lighter and our responsibility ceases. The sick belonging to the regiment are also discharged at the end of five days if able to move.

The actual disinfection work has been done by Dr. Smith, and, of course, carefully done. As soon as a transport's time comes for handling she is run alongside a mooring wharf which Colonel Bellinger built near the station. She begins at once the discharge of baggage onto lighters and the wharf. One of our officers then goes over this baggage with a large force of men, separating mess outfits, guns, ammunition, stores, and such things, and passes them along out of the way. The boxes of clothing or any box containing clothing, trunks, or bags are then run through steam or are formaldehyded. Each and every box is opened, and if it contains fabrics the contents are taken out almost to the bottom and formaline sprinkled on that layer, and then another layer of clothing and this sprinkled, and so on until the box is repacked and tightly nailed up. This baggage is then held forty-eight hours. The steam plant will hold the clothing of five or six companies in heavy marching order—that is, what is known as "blanket roll." In these rolls is usually carried only the blanket and extra clothing. The companies march onto the quarantine ground and stack arms. Their ponchos, knapsacks, toilet articles, etc., are taken out and then each company marches into the disinfecting house and hangs its blankets and clothes on the racks. This is continued until the racks are full. After coming out of the chamber the last company to put on blankets march in to get their things, which are on top; then the next company, and so on until they have back all their effects. During the time that steam was on the men have dipped their ponchos, knapsacks, etc., into bichloride 1-800. I do not believe this was necessary, but as it had been commenced it was continued. These troops are then transferred to Daufuski, and their detention commences from that hour.

Dr. Smith and his assistants all live at quarantine, and no one working there is allowed to leave. Besides the officers of the Service under Dr. Smith, Colonel Bellinger has furnished him nearly a hundred men, under his exclusive control, to handle the disinfection.

The mayor and Dr. Jarrell, the acting health officer, have been furnished the details as they come up and their suggestions have been followed. The coming of Surgeon-Colonel Greenleaf upon the field has relieved me of a great deal of worry. Before he came I was often brought to my wits' end to avoid friction with volunteer officers. He has respected every restriction put upon his own movements in visiting Daufuski. It is a pleasure to cooperate with such an officer.

Respectfully, yours,

J. O. COBB,

Passed Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON DISINFECTION OF BAGGAGE OF RETURNING TROOPS. SAVANNAH QUARANTINE.

By P. A. Surg. A. C. SMITH.

As stated in Public Health Reports for May 19, 1898, page 714, all baggage of troops returning from Cuba after March 1 was required to be disinfected previous to entry into the United States. P. A. Surg. A. C. Smith was in charge of this work at the Savannah quarantine station, and he reports as follows:

NORFOLK, VA., May 29, 1899.

SIR: As directed in Bureau letters of the 12th instant, I have the honor to report upon my work at Savannah, Ga., in connection with the returning troops from Cuba.

In obedience to telegraphic orders received March 22, 1899, I left Norfolk for Savannah the same evening, arriving the following afternoon and meeting P. A. Surg. J. O. Cobb, who was in charge of the operations of the Service at Savannah,

and Asst. Surg. M. H. Foster. Early the following morning we went together by one of the tugboats in the service of the Army Quartermaster's Department, to the quarantine station, which is situated about 11 miles down the Savannah River and about 3 miles above Tybee Island, on the right bank of the river and directly on the channel.

Passed Assistant Surgeon Cobb had been on the ground only one day before me. Assistant Surgeon Foster had been engaged several days, under general orders, to assist the depot quartermaster, Col. J. B. Bellinger, United States Army, and the local quarantine officer, Dr. W. J. Linley, and he had worked out and organized a considerable part of the scheme for the disinfection of the baggage and effects of the soldiers.

The work which was presented to us to do was of great magnitude, and unusual in character or even without precedent. Large numbers of volunteer troops, imperfectly disciplined, were to be brought into the country as rapidly as possible, through a Southern port, at the beginning of the warm season, from one of the most dangerously infected spots in the world. The task was undertaken without any special preparations having been made in advance and without any appliances beyond those used in ordinary maritime quarantine. The result was gratifying by reason of its success, and the comparatively small amount of discomfort suffered by those against whom quarantine measures had to be enforced.

The equipment of the Savannah station was in many ways well adapted to the work. A wharf 400 feet long was directly on the river channel, with sufficient depth of water beside it to accommodate all the river craft and even small-sized steamships. A bridge about 100 feet long connected the wharf with firm ground and brought it into immediate communication with the disinfecting house, in which there was a steam disinfecting cylinder 30 feet long by 8 feet in diameter. The cylinder was fitted with racks hung to three trucks running on an overhanging track, besides which the floor of the cylinder could be used for bulky articles in case of necessity. Beside the disinfecting house was a plot of sandy ground about 100 feet broad by 300 feet deep. This plot of ground proved of great service as a place for distributing companies of troops to sort their light baggage and prepare it for disinfection. It could not be used in rainy weather, and in such weather work had to be suspended.

In order to enable the Marine-Hospital Service to work with authority in the quarantining of the soldiers at a local station, Passed Assistant Surgeon Cobb obtained the following letter from the mayor of Savannah, which, however, proved scarcely necessary, except as a matter of form:

"SAVANNAH, GA., *March 23, 1899.*

"SIR: I have requested Dr. Cobb and the officers of the Marine-Hospital Service to inspect and superintend the fumigation of the effects of all army transports entering this port, so that you may be able to give your attention to the merchant vessels over which they have no control.

"This, of course, entitles them to make use of our plant when not necessary for merchant vessels.

"Yours, truly,

HERMAN MYERS,

"*Mayor.*"

"Dr. LINLEY, *Quarantine Officer.*"

Assistant Surgeon Foster had already received from the Bureau a decision that the clothing worn by the soldiers, and their persons as well, did not require disinfection, and had received authority to disinfect the heavy baggage by the use of formalin in close boxes and trunks. A routine of procedure was accordingly quickly worked out as the first two or three regiments were put through. The soldiers were brought ashore in detachments in heavy marching order, which means that they carried on their persons their arms, blanket rolls, containing blankets, shelter tents, ponchos, and commonly changes of underclothing, can-

teens, knapsacks, and haversacks, containing small toilet articles and mess kits. Weapons and other metal articles, such as mess kits and canteens, were excepted from disinfection. Ponchos, haversacks, and knapsacks, which would be injured by steam, were dipped in bichloride solution. Blankets and underclothing and the like were subjected to steam heat in accordance with the regulation method.

It was found that the light baggage of these companies could always be attended to in one lot, and this was the usual size of the detachments, although occasionally four or even six companies were put through at a time. The companies marched to the open ground beside the disinfecting house, stacked arms, opened ranks, and spread their effects on the ground to sort. They then marched into the disinfecting house in small divisions in charge of their own officers, and placed their blankets and clothing on the racks of the steam cylinder, afterwards reversing this process when the clothes were steamed and ready to be taken away. Tubs of bichloride solution were prepared at one side of the grounds and the companies marched in double file past these to dip the articles requiring this mode of disinfection. Civilians and discharged soldiers coming with the troops could not be handled as easily as the organized companies, but were formed into some kind of squads and put through in practically the same manner.

Colonel Bellinger worked early and late, cooperating with us, and took charge of everything pertaining to the movement of the troops and their baggage, relieving us from responsibility in this, besides furnishing us with an unlimited number of clerks, laborers, and other helpers, and with all necessary tools.

The light baggage which the soldiers carried in heavy marching order served to enable them to go into camp while waiting for their other baggage. They were accordingly transported immediately from the quarantine station to camp elsewhere as soon as they had passed through the process described above. The disinfection of the heavy baggage was more tedious and laborious. This baggage comprised the most wonderful collection of valuable and useless articles I have ever seen. Besides the ordinary luggage which individuals and armies would carry in traveling, it contained knickknacks of every description, monkeys, parrots, and yellow dogs without end, and even a mahogany log, a baby cradle and a pet hog were seen. Early in the beginning of the work a wharf was built in the river about half a mile above the quarantine station, to be used in unloading baggage from the transports. The heavy baggage was put out either on this wharf or on lighters: the travel rations, cooking utensils, and a few other articles which did not require disinfection were sorted from it and put onto separate lighters to be taken away with the regiment, and the remaining baggage was taken on lighters to the station to be disinfected. The laborers were divided into gangs of 5, each gang in charge of a quartermaster's clerk, and as many as could work together were put to disinfecting a lighter load of baggage, under the supervision of 2 medical officers. The boxes and trunks were opened, and the articles removed and sprinkled freely with formalin as they were replaced. Bedding found in the baggage was steamed. After treatment with formalin the baggage was taken to the Gordon wharf in Savannah and held there under guard until 48 hours had expired. Each regiment left a detail to guard the baggage until its disinfection at the station was completed and it was sent away, and they were constantly with it while the work was in operation. The details were limited, so far as possible, to one or two men from each company, besides the commissioned officers commanding them.

In the case of the regiments arriving before April 1 only disinfection was required. From that date on detention of the troops after disinfection was necessary, but the distinction made practically no difference with work at the quarantine station proper, as the detention camp was located elsewhere.

The regiments which arrived before April 1 had not been warned of any quarantine restrictions or necessity for disinfection of baggage, and took the matter rather unkindly, in some instances causing both the quarantine officers and them-

selves annoyance and delay. One such regiment was disposed to question the authority under which quarantine was enforced and to resist quarantine measures, and went so far as to propose to take some of the officers' baggage away from the station by force, until they found that they could not get it and themselves transported unless regularly released. This regiment caused us a great deal of trouble and suffered much inconvenience and delay themselves in consequence. There was also a disposition shown by many of the soldiers to make unreasonable charges of loss and damage to baggage in the disinfecting. One soldier made loud outcry about a shirt having been burned in the steam chamber. I went over to him and took it in my hands to examine, and found it entirely unharmed. On another occasion an officer in charge of a detail guarding baggage complained that a quantity of bedding belonging to his regiment had been left at the Fort Pulaski wharf where he could not get it, and intimated that it consisted of valuable feather beds and eider-down quilts belonging to officers. I went over to the wharf and inspected it, and found it to consist of excessively filthy cotton quilts and straw beds and cotton mattresses which had evidently been abandoned as useless, and I took the responsibility of ordering it burned.

For the most part, however, matters went smoothly, particularly after April 1, and the friction was scarcely different from what is always experienced in quarantine work. No case of actual yellow fever was discovered among the sick who reached quarantine. There was a great deal of difficulty in getting at the sanitary history of the regiments on account of the disposition of the regimental surgeons to represent everything at the best under all circumstances. In this they proved themselves not different from others with whom I have had to deal in the course of considerable quarantine experience.

On April 18 the quarantine station was turned over in its entirety to national control and the Marine-Hospital Service, but this made no change in the routine of the work in its relation to the troops. The last of the regiments was finished April 27, and five days later, on May 2, there was a general release from quarantine of those who had been engaged in the work just described. Besides the regular medical officers of the Marine-Hospital Service employed in the work and Hospital Steward E. B. Scott, who was assigned to duty at the station, 4 temporary acting assistant surgeons were employed by the Service.

I kept a brief memorandum of the treatment of the various regiments according to the dates on which they passed through quarantine, but as this would not be of interest in a general report and would extend the report too much, I omit it.

Respectfully, yours,

A. C. SMITH,

Passed Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON THE DETENTION CAMP, DAUFUSKIE ISLAND.

By Asst. Surg. R. H. VON EZDORF.

OFFICE MEDICAL OFFICER IN CHARGE, DETENTION CAMP,

Daufuskie Island, South Carolina, May 9, 1899.

SIR: I have the honor to submit the following report regarding the detention camp for soldiers of the United States Army on Daufuskie Island, South Carolina.

I arrived on this island April 11, 1899, and, in accordance with directions of P. A. Surg. J. O. Cobb, was made quarantine officer and ordered to enforce the United States quarantine regulations.

I ascertained that the island was inhabited by about 400 negroes. The sight selected for the detention camp was that portion of the island known as "Bloody Point."

I then visited the officer commanding the camp, Colonel Brown, of the Fourth Tennessee Volunteer Infantry, and informed him of my instructions. There were

no established quarantine limits, so I surveyed the camp grounds and defined the following boundaries: Beginning with the wharf south, along beach to tent camp of provost guard northeast, along line from tent to three trees; from there along a road to another guard tent, thence at right angles to this road to the beach, and again from this point to the wharf.

It was strictly enjoined that the men confine themselves within the limits of the camp, as any man found outside the limits or in a boat off the shore would be immediately arrested and detained an additional five days, unless given written permission by the quarantine medical officer.

The commanding officers of each regiment arriving in camp were informed of these rules, and requested to have company commanders inform their men and see that these rules were thoroughly understood.

I then addressed the following letter to Colonel Brown, commanding the Fourth Tennessee Volunteer Infantry:

"APRIL 12, 1899.

"SIR: I have the honor to request that you would cause to be furnished me a field report of regiments undergoing detention on Daufuskie Island, in accordance with United States Marine-Hospital Service regulations; also, a roll of discharged soldiers, laborers, and stragglers now on the island, with date and hour of arrival of all; also, that there be sent me each day a field report of new arrivals.

"The United States quarantine regulations require the detention of each man coming from suspected territory for five full days after disinfection.

"Respectfully, yours,

"R. H. VON EZDORF,

"Assistant Surgeon, U. S. M. H. S., Quarantine Officer.

"Colonel BROWN,

"Commanding Fourth Tennessee Volunteer Infantry."

A detachment of 40 men, Company M, Second United States Infantry, with First Lieut. P. E. Marquart commanding, had been sent to carry out the quarantine regulations which were to be established.

I suggested the establishment of 6 Cossack posts, and a special guard for the wharf. The Cossack posts were located, at a point on the beach northeast of camp, a second about 200 yards to the east of this, a third at the intersection of two roads meeting at right angles and about 300 yards east of the second, and then three along the road running south to the beach.

Each guard tent (Cossack post) had 1 noncommissioned officer and 3 privates. The guards at each post were changed every twenty-four hours. There was always 1 man at each post on guard duty, each one being on duty two hours and off four hours.

Along the beach and wharf guards had instructions to allow no landing of boats, nor anyone on the wharf except the quartermaster, superintendent, quartermaster's checkers, and the laborers under their immediate supervision.

I visited all commanding officers upon their arrival and made the acquaintance of regimental medical officers, and with them visited the hospital daily, and was kindly shown their patients.

On the departure of a regiment the colonel commanding was requested to have each company pass in single file on the wharf to the boat. As each company came upon the wharf for inspection I requested the captain to stand by me and recognize his men and any civilians attached. The men and officers of each company were also counted and checked off the field report.

Civilians not attached to regiments were required to report their arrival to me, and report daily for five days from that date. At time of their departure their names were called and checked off.

All laborers were under the supervision of quartermaster's checkers. Roll was called daily, so that anyone found missing could be reported to me.

I had established a point for a trading post on the lines to the northwest, where

the colored residents of the island could sell their goods, but this was afterwards abolished, as the privilege was abused.

Acting Assistant Surgeon Bradfield was the army medical officer in charge of the army medical affairs, and the general sanitation of the camp. Upon his being relieved, I was asked to take charge of this work, and a hospital for the sick left by regimental surgeons. I had the excrement troughs, which were exposed and near the camps, moved 75 yards from the nearest tent, and surrounded by a board fence. These troughs were cleaned twice daily by scavengers, and well lined with a mixture of lime and sand. I suggested that all ditches be dug deeper, and as a result there was a free flow of waste water, and a thorough flushing out of them by sea water on every high tide.

The water supply of the camp I found good, its source being from an artesian well of 300 feet. A steam force pump had been erected, and from it extended pipes over the ground, branching out to all points in the camp. A tank of 6,000-gallons capacity gave the night supply. Garbage and other waste matter was thrown in barrels, which were placed 20 yards from kitchens, and which were emptied once or twice daily. Cleanliness of the camp was maintained by details from each company, over which the officers had general supervision.

The general health remained good during the whole time. Of course, there were a few sick, but few new cases developed—none of a suspicious character. At a time during inclement weather some illness developed, due to climatic influences.

There passed detention, officers, 431; enlisted men, 9,278; civilians, attached, 125; civilians, 721; total, 10,555.

Camp closed May 8, 1899. All property of the Army removed, the grounds cleaned, sinks well lined, and troughs and other boxes used for excrement, burned.

In conclusion, I wish to state that the quartermaster, Capt. F. W. Woodring, did all in his power to assist me in enforcement of all quarantine regulations, and also in maintaining the general sanitation of the camp. Every courtesy was shown me by him, and also all officers of the different commands, which facilitated my work and made things work harmoniously.

I received valuable suggestions from Dr. Cobb, who gave me many suggestions to facilitate carrying out his orders, leaving me to work out the details.

Respectfully, yours,

R. H. VON EZDORF,
Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure No. 1.]

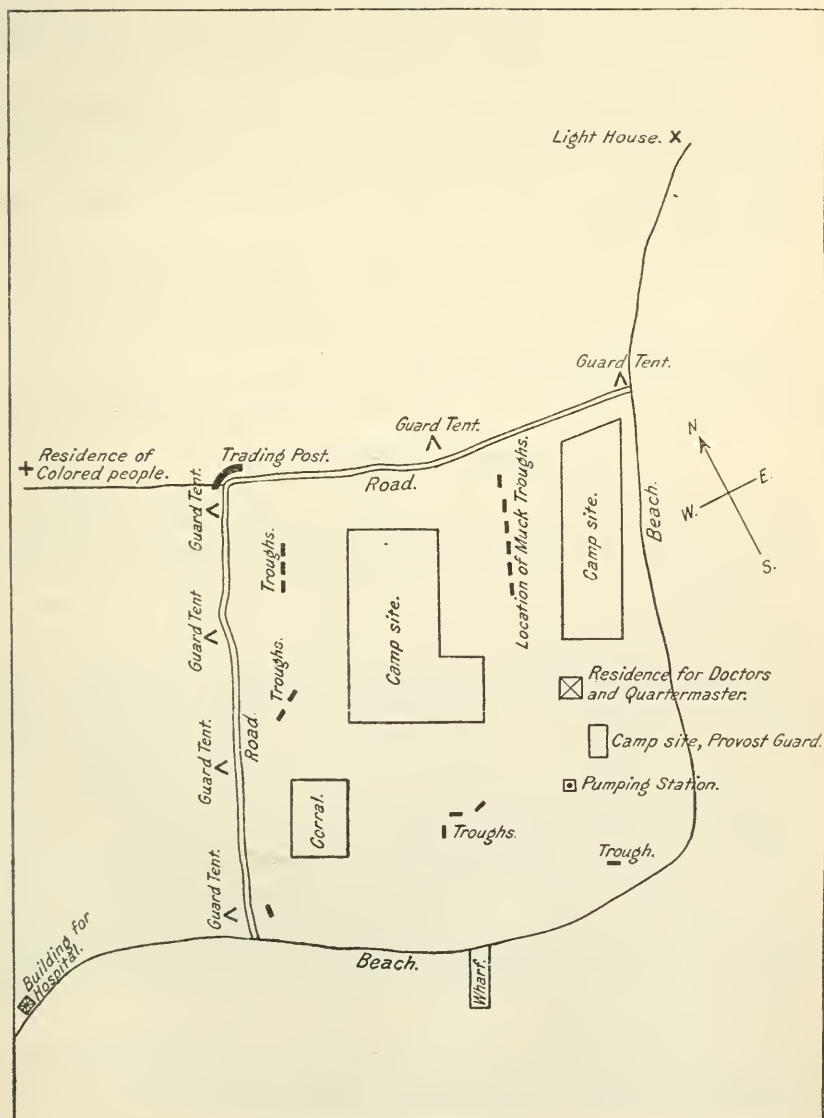
*Statement showing total number detained for five days at Detention Camp, Davis-
fuskie Island, South Carolina, April 13 to May 3, 1899.*

Date of de- parture.	Troops.	Officers.	Enlisted men.	Attached civilians.	Other civilians.
April 13	Fourth Tennessee Volunteers	42	1,138	16	-----
April 14	Forty-ninth Iowa Volunteers	20	444	5	-----
April 15	Details	-----	-----	-----	-----
April 16	Forty-ninth Iowa Volunteers	29	479	12	-----
Do	Sixth Missouri Volunteers	43	1,030	36	-----
April 17	Details	-----	-----	-----	23
April 18	Third Kentucky Volunteers	46	995	-----	-----
Do	Third Nebraska Volunteers	46	878	3	34
April 19	Details	-----	-----	-----	18
April 20	do	-----	-----	-----	40
April 21	do	-----	-----	-----	12
April 22	do	-----	-----	-----	12
April 23	Third Engineer Volunteers	45	800	30	38
April 24	Second Engineers	21	339	14	24
April 25	Thirty-first Michigan Volunteers	46	988	1	-----
April 26	Details	-----	-----	-----	3
April 27	do	-----	-----	-----	154
April 28	Ninth Illinois Volunteers	43	1,075	6	54

Statement showing total number detained, etc.—Continued.

Date of departure.	Troops.	Officers.	Enlisted men.	Attached civilians.	Other civilians.
April 29	Details				29
April 30	do				7
May 1	do				
May 2	Sixth Ohio Volunteers	47	1,072		49
May 3	Second Infantry Regiment	1	40	2	125
May 6					33
May 8		2			66
		431	9,278	125	721

[Inclosure No. 2.]



Detention Camp, Daufuskie Island.

[Inclosure No. 3.]

SAVANNAH, GA., April, 21, 1899.

SIR: Since you have kindly consented, at my request, to assume charge of the army medical affairs at Daufuskie Island as successor to Dr. Bradfield (whom I relieved from duty), I have the honor to ask that you will transmit to Captain Snyder, U. S. A., in charge of the medical supply depot at Savannah, an informal memorandum receipt for the medical property now on the island, which was under the charge of Dr. Bradfield, and, after the troops leave and the camp is broken up, request the quartermaster to return whatever of this property may be remaining to the medical supply depot at Savannah, when Captain Snyder will return your memorandum receipts to you.

My object in sending medical supplies to the island was to provide hospital accommodations for any sick that a departing regiment might be compelled to leave behind, and also to furnish such medicines to regimental surgeons as they might require for their sick during their period of detention.

I shall be glad also if you will take charge of the sanitary supervision of the camp, informing the quartermaster of any steps that you deem necessary to secure the proper location of the sinks and the prompt and efficient removal of excreta and garbage.

Thanking you in advance on behalf of my department for your interest in the welfare of our sick, I am,

Very respectfully, your obedient servant,

CHAS. R. GREENLEAF,
Colonel, Medical Inspector, U. S. A.

Dr. R. H. VON EZDORF,
Marine-Hospital Service, Daufuskie Island.

LETTERS OF COMMENDATION.

SAVANNAH, GA., May 6, 1899.

MY DEAR DOCTOR: I inclose herewith a copy of a letter sent to Dr. von Ezdorf, whom I regard as one of the brightest and most efficient young men I have met in any of the Services.

I congratulate you on the success of your officers in managing the quarantine, the like of which has probably never been attempted, much less executed, by any health department in the world.

I regard the success of the work largely due to the skillful management of Dr. Cobb, who proved himself a fine administrative officer and a first-class diplomat in avoiding the military shoals that were coming into his way almost every day of his service.

I regret very much that I did not have time to call on you and Dr. White while in Washington, since there was a great deal that I wanted to talk about in connection with this and the transport service.

It seems to me that you could do a good piece of work by having some one of your officers prepare a manual on the general management of the quarantine service, with special reference to the military transportation service, since the subject is one with which our people are but little acquainted. It is true they have books on hygiene to which they can refer, but there is a crying need for an epitome of the subject, and such a work would be gratefully received by all of us.

Very sincerely, yours,

CHAS. R. GREENLEAF.

Dr. WALTER WYMAN,
Surgeon-General U. S. Marine-Hospital Service, Washington, D. C.

SAVANNAH, GA., May 6, 1899.

MY DEAR DOCTOR: I desire to thank you, in the name of our department, for your kindness in taking charge, at my request, of the hospital and other army medical affairs at the detention camp on Daufuski Island after the relief of Acting Asst. Surg. George M. Bradfield.

By your excellent administrative methods perfect order was instituted, harmony established with the regimental surgeons, the hospital perfectly organized, and the sick furnished with every attention it was possible to give them.

Your counsel and advice in regard to the sanitation of the camps has been of great assistance to me, and has enabled the department to maintain its large body of returning soldiers in almost perfect health.

I also desire to bear testimony to the efficiency with which the work of your own department has been performed, and to say that it has given satisfaction to all the military authorities with whom you have been brought in contact.

Wishing you every success, and hoping that our lines may fall together again, I am,

Very sincerely, yours,

CHAS. R. GREENLEAF,

Colonel, Medical Inspector of the Army.

Dr. R. H. VON EZDORF,

U. S. Marine Hospital Service, Daufuski Island, S. C.

REPORT ON THE DETENTION OF TROOPS AT SOUTH ATLANTIC QUARANTINE.

By Asst. Surg. TALIAFERRO CLARK.

SOUTH ATLANTIC QUARANTINE STATION, May 16, 1899.

SIR: As directed by Bureau letter, May 12, 1899 (P. M. C.), I beg to report as follows concerning operations under orders in connection with troops returning from Cuba:

March 6, 1899, the following telegraphic orders were received:

"All baggage and effects of soldiers from Habana and Cienfuegos must be disinfected prior to vessel's entry. This regulation takes effect at once. Soldiers' baggage and effects from all Cuban ports must be disinfected after March 15, by direction of the Secretary of the Treasury.

"WYMAN,
Surgeon-General."

In compliance with the above directions, the baggage and effects of the First Maine Volunteers, arriving at this port March 11, 1899, on board United States transport *Michigan*, from Habana, were disinfected. Six hundred and sixty-eight soldiers and 20 stowaways were disinfected in the following manner: The men were taken off the vessel in detachments, stripped, and their clothing, rolls, and dog tents disinfected by steam, and the men isolated on the island. After completion of the disinfection of the personal effects, their baggage was disinfected. All fabrics were disinfected by steam; relics and containers by formol. The stowaways were vaccinated. Vessel given pratique March 14, 1899. On March 22, 1899, the following telegram was received:

"Not deemed necessary to disinfect clothing actually being worn by soldiers, unless individual cases should be deemed suspicious, but fabrics in knapsacks should be looked after.

"WYMAN."

On April 3, 1899, the United States transport *Sedgwick* arrived from Santiago de Cuba, via Guantanamo, remanded from Savannah, having on board the Third Volunteer Infantry, 818 officers and men, baggage and personal effects disinfected

as in case of the *Michigan*, with the exception of clothing actually worn. As fast as disinfected the various companies were isolated on the island, tents having been erected for their accommodation by the Quartermaster's Department. The vessel was fumigated, soldiers reembarked, and vessel remanded to Savannah quarantine April 7, 1899.

The United States transport *Dixie*, from Casilda, Cuba, via Savannah, Ga., arrived April 3, 1899, with the Fourth Tennessee Volunteer Infantry, 1,135 soldiers and 44 officers: 1 death on voyage, and 2 suspicious cases reported from Savannah. After a careful examination by Assistant Surgeon von Ezdorf and myself of all the sick on board nothing suspicious was found, one of the cases in question (intermittent malarial fever) reporting for duty on the third day; the other case proved to be malarial hæmaturia. As soon as disinfection of troops on *Sedgwick* was completed, the personal effects of 600 men aboard the *Dixie* having been disinfected, the vessel was ordered by Colonel Bellinger, Quartermaster Department, to proceed to Savannah quarantine. This action was taken because Blackbeard Island was thought to be an unsuitable place for the encampment of large bodies of troops. The ocean beach was not inspected for the purpose of locating a camp. The *Dixie* left April 6, 1899, without certificate. In addition to this work, 7 transports, with an aggregate crew of 755, were remanded to this station from Savannah, Ga., for disinfection before departing for Cuba. These vessels were disinfected according to the regulations of the United States Marine-Hospital Service, and upon its completion they were remanded to Savannah quarantine. One exception was made, in case of the *Kilpatrick*; her condition on arrival being so insanitary said vessel was detained five days after disinfection at this station, upon the recommendation of your representative, approved by the Bureau.

Respectfully, yours,

TALIAFERRO CLARK,

Assistant Surgeon, U. S. M. H. S., in Temporary Command.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

DETENTION OF TROOPS AT TORTUGAS QUARANTINE STATION.

By Asst. Surg. W. R. MCADAM.

TORTUGAS QUARANTINE, FLA., May 22, 1899.

SIR: In compliance with Bureau letter of May 12, 1899, directing a report of operations, under orders received, in connection with troops returning from Cuba, I have the honor to make the following report:

Acting under telegraphic orders to proceed to Tortugas and report to Assistant Surgeon Anderson, I arrived at this station on March 23. On the morning of March 26 the transports *Florida* and *Kilpatrick*, having on board the First Regiment of Texas Volunteer Infantry, arrived. The *Florida*, carrying the baggage, equipment, and 4 companies of the regiment, was brought to the wharf, while the *Kilpatrick*, too large to enter either channel, anchored in the outer harbor.

The troops on the *Florida* were at once disembarked, and as each company landed, its blanket rolls and the contents of knapsacks were inspected. All fabrics were tied up in the blankets, the bundles marked by stencil, and placed in the steam chamber. The ponchos were placed in piles by companies, and dipped in a solution of bichloride of mercury 1:1000 by quarantine employees. The companies were marched into the fort and quartered in the casemates.

The heavy baggage was hoisted onto the dock and there opened by details from the companies. The clothing and fabrics were made into bundles under the careful supervision of a medical officer, marked, and, after steaming, repacked.

The tents, cots, etc., remaining in the hold were arranged to permit of penetration, the baggage replaced, and all subjected to fumigation by sulphur dioxide.

The uniforms of the officers were placed in staterooms, and disinfected by formaldehyde gas. Three days were required to complete work on the *Florida*.

The majority of the troops were on board the *Kilpatrick*, but as they had no baggage with them on the boat, except their blanket rolls and knapsacks, their disinfection was easily accomplished. With the energetic aid of Acting Assistant Surgeon McConnell, the fabrics contained in the blanket rolls and knapsacks were made into bundles, marked, and sent to the disinfecting wharf by the tugboat *Powhatan*. An immediate inspection of the vessel was made, and it was found that a number of articles, such as towels, underclothes, etc., had been left out of the knapsacks, so these were collected and placed in a solution of bichloride. The ponchos were dipped in bichloride solution on board. The uniforms of the officers were treated as on the *Florida*.

Several trunks were found in the rooms of the officers, and these were treated by unpacking, sprinkling formalin between the successive layers of clothes as they were replaced, and closing the lids tightly.

Both vessels were discharged on March 30. During the last three days of this work Assistant Surgeon Anderson was physically unfit for duty, but in spite of illness, carried on the work with unflagging energy, and maintained a strict personal supervision over every detail.

On March 31 the transport *Vigilancia* arrived, with 4 companies of the Ninth Illinois Volunteer Infantry on board. The vessel had left Habana without a bill of health. As this transport was also too large to be brought to the dock, it was necessary for the medical officer to remain on board, while Senior Hospital Steward Kolb conducted the steam disinfection at the wharf.

The blanket rolls, knapsacks, ponchos, and the uniforms of the officers were treated as outlined for the transport *Kilpatrick*.

The heavy baggage was opened in the hold by the troops, under careful observation, and the clothing made into bundles and sent to shore. Particular attention was paid to the hospital equipment used in Cuba, as a number of dirty mattresses and some soiled linen had been packed away. After the baggage had been unpacked the hold containing the boxes was fumigated with sulphur dioxide.

On April 2 the disinfected clothing was returned to the ship and after an inspection of the troops the vessel was discharged.

Some inconvenience was experienced in treating these vessels, as the supply of formalin shipped to this station had been delayed en route, and there was none on hand for use in the autoclaves. The generation of the gas from methyl alcohol proved unsatisfactory, as the lamps were about worn-out and unreliable. Fortunately, Acting Assistant Surgeon McConnell had a sufficient supply on hand for the disinfection of the trunks on board his vessel.

The transport *Logan*, bringing the Third Nebraska Volunteer Infantry to this place for disinfection and detention, arrived on the morning of April 8. She was too large to reach the wharf, so was anchored in the outer harbor. A heavy norther was blowing and the sea was so rough that neither troops nor baggage could be landed. After waiting two days for the weather to moderate the vessel left for Savannah without unloading.

I wish to acknowledge the hearty cooperation and valuable suggestions given by Assistant Surgeon Lumsden in arranging plans for handling these troops.

Respectfully, yours,

W. R. McADAM,
Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

DISINFECTION OF EFFECTS OF RETURNING SOLDIERS AT EGMONT KEY.

By Surg. P. M. CARRINGTON.

EGMONT KEY, FLA., April 7, 1899.

SIR: I have the honor to report as follows concerning the operations of this camp:

The steamship *Yarmouth* arrived off the station about 7 p. m. of the 5th instant. She was boarded by Assistant Surgeon Corput and myself, and arrangements made for the landing of the troops. The following morning, about sunrise on the 6th instant, the steamship *Whitney* came in. There was a heavy gale from the northeast blowing all night of the 5th and until noon of the 6th. This caused such a heavy sea as to preclude the possibility of landing either troops or baggage until about 3 p. m. on the 6th, when lighters were gotten down from Port Tampa, and taken alongside the vessels, loaded with baggage and troops, and brought to the wharf. Taking possession of the light-house wharf and buoy shed was a happy idea of Assistant Surgeon Corput, and without the wharf we would have been unable to land either troops or baggage. Immediately upon taking possession of this wharf we proceeded to construct thereon five tight chambers, each having a cubic capacity of 1,000 feet, for use as formaldehyde disinfecting chambers. We also constructed a chamber in our own disinfecting shed, having a cubic capacity of 1,300 feet, giving us a total of six chambers besides the steam chamber. Immediately upon the landing of the first troops the disinfection was begun, using the air-tight rooms and the steam chamber, all with formalin.

The first troops landed were set to work unloading baggage and pitching tents. About dark we succeeded in landing the last of the troops, got them into camp, and had them all fed and supplied with disinfected blankets by midnight.

All during last night there was a heavy blow, and at 6.30 this morning there was a heavy rain, with an increase in the velocity of the wind, which, however, was fortunately offshore.

Disinfection is progressing this morning as rapidly as possible in such weather. The disinfection is being done entirely by our own force, the trunks being simply unlocked by the owners and passed into the shed.

I have placed P. A. Surg. G. M. Magruder in charge of the disinfection, with Assistant Surgeon Corput and Senior Steward Peck and a force of men to assist him.

The troops now in camp consist of the first and second battalions of the Fourth Illinois Volunteer Infantry, with regimental headquarters, staff, band, and hospital corps.

There is still some baggage and 10 horses to be gotten off the transports. This we will probably accomplish by noon to-day if the sea gets no heavier, although it is a heavy task to land baggage and to get it to the storehouse in the driving rain.

I have quartered and messed the officers in one of the long mess halls.

The troops are generally in prime physical condition, and there are only two men in hospital—one with an injury to his ankle and the other with a slight gastric trouble, from which he has suffered for several weeks. This man is now convalescent.

The landing of the troops and baggage was effected without accident to the men or loss of property.

I have been appealed to by the superintendent of the Plant Steamship Company to allow the *Yarmouth* and *Whitney* to go to Port Tampa for coal and water. He has been informed, however, that these vessels must either coal and water in quarantine or undergo the usual disinfection and detention. They will doubtless take coal and water in quarantine as soon as the weather will permit; probably not before to-morrow, and then proceed on the return voyage to Cuba without entering the port.

I have attempted to keep you advised by wire of all occurrences of importance, but the telegraph line between Braidentown and Tampa is frequently out of order, and this morning the cable from Egmont to Braidentown is not working.

The *Foster* is being used to convey mail, telegrams, and supplies between the camp and St. Petersburg and Port Tampa. The crew is not allowed to come ashore at the camp.

If further troops are to be sent here, it is requested that at least two large autoclaves be forwarded, in order that they may be used with the baggage which is required by the men while in detention. Most of the disinfection is now being done by the sprinkling method, the trunks being locked and sealed by pasting paper around the crack in the lid, the trunks then being piled and covered, as directed in your telegram of the 5th instant.

I have one No. 2 and one No. 1 autoclave, the former obtained from Dr. Echemendia and the latter from Acting Assistant Surgeon Altree. These, however, I would like to return as soon as possible.

The term of detention of these troops dates from sundown yesterday, and will terminate at sundown on Sunday. They will probably proceed to Tampa early Monday morning.

Respectfully, yours,

P. M. CARRINGTON,
Surgeon, U. S. M. H. S.

Since writing the above the velocity of the wind has increased to such an extent that the masters of the transports will not allow the lighters to come alongside. This will doubtless delay the work of disinfection to some extent.

The rain of this morning has completely refilled our fresh-water tanks, and I should have reported that Depot Quartermaster Brown, U. S. A., is laying a line of pipe from the wharf to our tanks and will keep us supplied with water. He has also supplied wood for cooking and considerable lumber for tent flooring, which, however, for lack of time, could not be utilized.

Considering all the adverse circumstances under which the work is being conducted, excellent progress has been made, and affairs are moving along with a minimum of friction.

It is impossible to make the regulation sanitary inspection of the men. I am, however, making a personal round and seeing all the men in their tents. Thus far no further sickness has been found to exist than has been reported above.

CARRINGTON,
Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

DETENTION OF TROOPS AT EGMONT KEY DETENTION CAMP.

By Asst. Surg. G. M. CORPUT.

UNITED STATES DETENTION CAMP,
Egmont Key, Fla., May 26, 1899.

SIR: In compliance with bureau letter of May 12, 1899, directing me to submit a report of operations at this camp in connection with the returning troops from Cuba, I have to respectfully submit the following report:

The camp was put in commission on April 2, and preparations begun for the reception of the troops.

The personnel of the camp at this time consisted of Surg. P. M. Carrington (in command), Asst. Surg. G. M. Corput, Senior Hosp. Steward F. H. Peck, Junior Hosp. Steward C. G. Carlton, and 8 hospital attendants.

On April 6, however, the corps was greatly reenforced by the arrival of P. A. Surg. G. M. Magruder,

The possibilities of the camp were very much limited by lack of wharfage and by the small disinfecting plant of the station.

Immediately after the receipt of orders to prepare the camp for the reception of about 800 soldiers, who were to arrive on steamships *Yarmouth* and *Whitney*, of the Plant Line, the U. S. S. *Charles Foster* was put in commission, and has since that time been used as dispatch and supply boat.

On April 3 Steward Peck was sent ashore to employ additional temporary attendants, and as soon as he returned with them they were put to work preparing for troops. An additional air-tight chamber was built, and racks put inside of it, preparatory to using it for disinfecting with formalin by means of an autoclave. A small No. 1 autoclave was borrowed from Acting Assistant Surgeon Altree, at Port Tampa, and a No. 2 autoclave from Dr. Echemendia, the quarantine officer at Mullet Key.

These arrangements did not, however, remove the difficulty caused by lack of wharfage.

At this time the idea of obtaining control of the wharf and buoy shed adjoining, belonging to the Light-House Department, suggested itself, and the Bureau was requested by wire to secure this wharf from the Light-House Board if possible.

As soon as the bureau telegram, informing us that this authority had been granted, was received, the buoy shed was cleaned out and 5 air-tight chambers built, with a capacity of 1,000 cubic feet each, and preparations were made for disinfection of all baggage, save knapsacks and blankets, at this place. The knapsacks and blankets were disinfected at the station, in the steam chamber, by means of formalin in vacuo, as these things were needed by men while in camp.

On April 3 the camp was visited by Capt. Robert L. Brown, assistant quartermaster, United States Volunteers, who informed us that he would supply lumber for tent floors, wood for fuel, and fresh meat and water for the troops, and that he would also send down a force of men to do such work as might be assigned to them. Unfortunately, however, the lumber and wood did not reach here until the day before the troops arrived, and too late to make any tent floors for first arrivals, and on account of the limited wharfage was much in the way and delayed the work considerably.

The first transport to arrive was the steamship *Yarmouth*. This vessel arrived at about 7 p. m. on the 5th, and was at once boarded by Surgeon Carrington and myself, and all aboard were found in good health and spirits.

A strong northwest wind was blowing at this time, and a very heavy sea running; this increased into a gale during the night and precluded the landing of either troops or baggage until noon of the 6th, when lighters were brought from Port Tampa and the disembarkation of soldiers and baggage began. The first men ashore were put to work pitching their tents at once.

The steamship *Whitney* arrived early on the morning of the 6th and anchored off the island. Surgeon Carrington and myself attempted to board her, but were compelled to abandon the attempt on account of very heavy sea and lack of suitable boat. About noon, however, the sea became calmer and I boarded her and made a preliminary inspection of troops.

All troops were landed by dark without mishap of any kind, but considerable baggage and 10 horses were left aboard the vessels. The men were all in their tents and by midnight had all been supplied with disinfected blankets.

On the morning of the 7th an attempt was made to bring the baggage remaining on board the vessels ashore, but on account of heavy sea the masters of the vessels refused to allow lighters to come alongside, and the work of disinfection was delayed to some extent in consequence. However, by dark everything had been brought ashore and the work of disinfection was going on rapidly and smoothly.

The disinfection was in charge of P. A. Surg. G. M. Magruder, assisted by myself and Steward Peck and a force of our own employees. The force was divided into squads of 6 men, under a foreman, whose duty it was to see that the work was properly done and that nothing was left out of trunks and boxes. The disinfection was done by the sprinkling method with formalin, as authorized in bureau telegram of April 5, 1899. After the goods were thoroughly sprinkled the cases were closed and stored in air-tight chambers for seventy-two hours; tight trunks had a strip of paper glued all around the edge of the lid and were closely piled in a corner of buoy shed, under cover. All disinfection was done by camp employees, and soldiers were not allowed about, and were simply required to unlock trunks and boxes before passing them into the shed.

The first troops to arrive were the first and second battalions of the Fourth Illinois Volunteers, and the staff, band, and hospital corps of the same organization. The men were generally in prime physical condition, and there were only 2 men in hospital, one with an injury to his ankle and the other with a slight gastric trouble, and no other sickness of any kind developed among them during their stay in camp.

Individual discharge certificates, a copy of which is inclosed, were issued to each man at his departure. The first lot, consisting of 714 officers and men, were discharged on April 9, after the completion of three full days' detention. It was impossible to make regular inspections of the first arrivals, but the men were visited daily in their tents by Surgeon Carrington. After the discharge of this lot of troops the quartermaster force began putting down tent floors and laying a line of pipe from wharf to tanks within reservation, but work was done very slowly and only about 40 floors were completed before the arrival of the second lot of troops.

On April 12 Surgeon Carrington was relieved of the command of the camp and ordered to proceed to Brunswick, Ga. The command of the camp then devolved on Passed Assistant Surgeon Magruder.

The second detachment of troops, consisting of the Third Battalion of the Fourth Illinois Volunteers, arrived on the morning of April 14, and all were in camp and baggage in buoy shed by 3 p. m. of the same day, and disinfection progressing without hitch of any kind. The health of this battalion was even better than that of the first two, and there was not a single man unfit for duty. By this time the line of pipe from wharf to tanks had been completed, and at the request of Passed Assistant Surgeon Magruder 10,000 gallons of water were sent down by Captain Brown, assistant quartermaster, United States Volunteers, and pumped into the tanks.

The soldiers were inspected daily by Passed Assistant Surgeon Magruder and myself, and no sickness of any kind occurred among them. They were discharged on the 17th, having completed their three days' detention on that day, and proceeded to Port Tampa, en route for Savannah, Ga. This left the camp without inmates other than employees.

On the 19th the Bureau telegram of the 18th, relieving Passed Assistant Surgeon Magruder from duty at this camp, was received, and on the morning of the 20th he departed for Key West. The command of the camp then devolved upon myself.

On the 20th, in compliance with Bureau telegram of that date, all temporary attendants not absolutely necessary were discharged and the force reduced to the minimum necessary to care for the property.

The chambers which had been built in the buoy shed were torn out and everything restored to its former condition and turned over to the light keeper, and the force was then kept busy cleaning up the reservation and getting everything in best sanitary condition possible.

On April 29 Bureau telegram informing me of the probable arrival of several

companies of the Signal Corps was received, and preparations were immediately begun for their reception. Control of wharf and buoy shed was again secured by the Bureau, and by May 1 everything was ready for the reception of the troops.

On May 4 the U. S. lighter *Canby* arrived with 37 stevedores from Habana aboard. These men brought me a letter from Sanitary Inspector W. F. Brunner, in which he stated that he believed that the men had not been ashore in Habana, but that he could not certify it. They were therefore detained, and what little hand baggage they had with them was disinfected. The men were without subsistence of any kind, and were therefore fed while in camp. The *Canby* returned to Habana without pratique.

At noon on the 4th the steamship *Mascotte* arrived with Lieutenant-Colonel Strong and 35 officers and men of the Seventh Signal Corps. Their baggage had all been disinfected at Habana and was stored in buoy shed, with the exception of such articles as were absolutely necessary during their stay in camp.

The men were all in prime physical condition, and there was no sickness of any kind among them, with the exception of a few cases of venereal disease. During their stay in camp, however, one of the officers fell from the back door of the large mess hall in which the officers were quartered and sustained an ugly oblique fracture of the clavicle. He was attended by the medical officer with the detachment, and when he left seemed to be doing very well.

On May 7 another detachment of the Signal Corps, consisting of 2 officers and 32 men, arrived and were placed in the southern inclosure of the reservation. No communication of any kind was allowed with the ones already in camp.

On the 8th the detachment of the Signal Corps which arrived on the 4th was discharged, that date being the last of the five days from time of disinfection of baggage, and they, with all baggage, were taken to Port Tampa by the passenger steamship *Margaret*. The 37 stevedores were also discharged on that day. On the 9th another detachment of the Signal Corps, consisting of 2 officers and 29 men, arrived, and, as in previous cases, they were kept separate from inmates already in camp.*

The men in this detachment were also in prime physical condition, with the exception of a few cases of gonorrhea and one case of syphilis. On the 11th the detachment which arrived on the 7th was discharged, and on the 13th those who arrived on the 9th were discharged and proceeded to Port Tampa, en route for Savannah, Ga. This again left the camp without inmates other than employees.

On the 14th, however, another detachment of the Signal Corps, consisting of 1 officer and 25 men, arrived and were all in camp within two hours from time of landing. All baggage had been disinfected at Habana and was stored in buoy shed, with the exception of a few necessary articles. This detachment was also in splendid physical condition and no sickness appeared among them. They were discharged on the 18th, at the completion of their period of detention, and proceeded to Port Tampa, en route for Savannah, Ga. The discharge of this detachment again left the camp without inmates in detention, and I was informed by the depot quartermaster at Tampa, and also by the transportation company, that no more troops were to arrive.

On the 19th, however, a telegram was received from the Bureau informing me that more troops were to be expected. On the 21st the steamship *Olivette* arrived from Habana, with Col. H. H. Dunwoody, chief signal officer of Cuba, 1 medical officer, and 40 men of the Signal Corps aboard, and all were landed without mishap of any kind. The men were all in good condition when landed at 12.30 p. m., but at the afternoon sick call 2 cases of malaria were found. In 1 of these cases, however, the symptoms were not very typical, so I had the man put in a tent to himself, at some distance from the others, and no medicine was given him that day in order to allow his symptoms to become more marked and to prevent error in diagnosis. On the following morning, however, the men were both in

good condition and without temperature. Quinine was freely given to both, and neither had a return paroxysm during their stay in camp. By watching the case in which symptoms were not well marked I ascertained that he was a morphine habitué, and use of that drug was in all probability the cause of symptoms being somewhat masked in his case.

The detachment was discharged on the 25th, at the completion of full five days' detention from time of disinfection of baggage, and proceeded to Port Tampa en route for Savannah, Ga., and the camp was again left without inmates in detention. In view of the past history of the camp and the very large amount of sickness here last year, the present season has been a remarkable one, and while more than double the number of inmates have been detained here, not a single case of serious sickness has developed and not a man has been in the hospital. Much of this, however, is due to the better sanitary conditions prevailing in Cuba.

The camp had been fortunate in having in detention only organizations commanded by regular-army officers, and no unpleasantness of any kind has occurred, and our efforts to keep the camp in good sanitary condition have in every instance been ably seconded by them. Our relations with the State officials and with the transportation company have also been entirely harmonious, and no disagreements have occurred.

Much credit is due Senior Hospital Stewart Peck for the admirable way in which employees were handled, and the efficiency of the force was largely due to his good judgment and foresight.

Respectfully, yours,

G. M. CORPUT,

Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

TRANSPORTATION PROHIBITED FROM CUBA AND PORTO RICO OF REMAINS OF SOLDIERS WHO DIED OF YELLOW FEVER.

In April protest was made to the War Department against the return of the remains of soldiers who had died in Cuba and Porto Rico of yellow fever or fever of any character. Accordingly the War Department ordered that these bodies should not be brought back until the winter season, but the remains of soldiers who had been killed in battle or died from injuries were returned and interred in Arlington Cemetery. In a few instances these bodies were shipped to other places, the health officers and relatives being notified by telegram and prompt interment advised without opening the caskets. The transfer of these deceased heroes was viewed with apprehension by all sanitary authorities and required close surveillance to prevent possible risk.

THE YELLOW FEVER IN THE NATIONAL SOLDIERS' HOME NEAR HAMPTON, VA.

The official announcement on July 30, 1899, of the presence of yellow fever in the National Soldiers' Home near Hampton, Va., excited national interest and great apprehension on the part of neighboring cities and more or less remote communities having business or social relations with the Home. The great epidemic of 1855, which devastated the communities of Norfolk, Portsmouth, and Gosport, with a

record of some 2,800 deaths in a period of about three months, had by no means been forgotten, and added vigor to the precautionary measures which were at once established. The public interest appeared to be intense, both on account of the fear of the spread and because of the peril to which the inmates of the Home, some 3,700 old soldiers, veterans, were subjected. Particularly on this account the interest extended even to the Executive Mansion, where dispatches were sent by myself daily for the information of the President.

For a proper comprehension of the measures which were adopted it is necessary to understand the location of the National Soldiers' Home with reference to neighboring localities. Fort Monroe, with its military reservation at Old Point Comfort, just within the entrance to Chesapeake Bay and at the beginning of Hampton Roads; the town of Hampton, more remote from the Bay; the village of Phoebus, still more remote and practically a portion of the town of Hampton, and the National Soldiers' Home, whose grounds adjoin the town of Phoebus, together form almost one community, being connected with a trolley railway line which runs still farther, to Newport News, some 10 miles distant from the Soldiers' Home. Portsmouth, Berkeley, Craney Island, and Norfolk are but an hour's sail by steamer from Old Point, across and up the Elizabeth River, which is practically an estuary of the bay. Roughly speaking, Old Point Comfort (Fort Monroe) may be considered one point of a triangle whose sides stretch respectively to Newport News and Norfolk, with a third line between the latter two places. The line from Old Point to Newport News is overland, running through Hampton, Phoebus, and the National Soldiers' Home. The line from Old Point to Norfolk crosses Hampton Roads and the Elizabeth River, and that from Norfolk to Newport News crosses Hampton Roads, Portsmouth, and the Elizabeth River.

Saturday, late in the afternoon, July 29, the Bureau received a telegram from Major Vickery, chief surgeon, National Soldiers' Home, requesting the services of a yellow-fever expert for examination of certain cases at the Home which had aroused his suspicions. Surg. Eugene Wasdin, who was on temporary duty at Norfolk, was immediately ordered there by wire, and on Sunday night at 9 o'clock a telegram was received from him announcing the cases to be genuine yellow fever. In the same dispatch it was stated a cordon had already been thrown around the Home. The same night Surg. J. H. White, on duty in the Bureau in charge of the domestic quarantine division, was ordered immediately to proceed to Hampton and take charge of Service operations, to see that the Treasury regulations were enforced, to render Service aid in their enforcement, and, if necessary and practicable, to assume entire charge of the operations, his previous experiences giving assurance of appreciation of what should be done and the best methods of accomplishing it. The same night dispatches were sent to all the neighboring cities, warning them of the appearance of the disease at the Soldiers' Home and advising them to hunt for

any inmates of the Home who might be visiting in their midst and to keep them under close observation.

Acknowledgments were promptly received from Norfolk, Portsmouth, Newport News, Richmond, and Washington, D. C. The health officer of Norfolk wired that a house-to-house inspection was being made, and other cities wired that a search was being conducted for people recently from the Home. The same Sunday night, July 30, Passed Assistant Surgeon Wertenbaker was ordered from Wilmington, N. C., to report to Surgeon White at Hampton, to serve in charge of the cordon. He was given this duty because he was not immune, and because, through previous smallpox-inspection service, he was thoroughly acquainted with the locality. Surgeon Wasdin, the same night, was ordered to guard the town of Phoebus, and Dr. Farquhar, of Portsmouth, was appointed to consult with the health authorities of Portsmouth and Berkeley and aid in locating refugees. A wire was also sent to Surgeon Vickery, at the Soldiers' Home, offering him assistance in the Home and requesting him to furnish a list of all members of the Home who had departed within a month, and their destinations, to assist in tracing them.

The details of operations of the Bureau on succeeding days are for the most part narrated in the following daily record of events, taken from the weekly public health reports. The plan of campaign involved two objects to be attained: First, to prevent the escape of any infection from the National Soldiers' Home; second, to make search throughout the surrounding country for outside foci or any possible cases of yellow fever among those who had recently been at the Home. The measures adopted are made plain by the following description of the organization which was quickly effected:

First, Surg. Eugene Wasdin, as expert diagnostician. Surgeon Wasdin being an immune was able to visit both the infected locality and the suspected territory. He sent reports at first to the Bureau as to the number of cases, notified the Bureau of the first cordon around the Home, and inaugurated a house-to-house inspection in Phoebus during the short period before the arrival of Surgeon White, who immediately assumed the quarantine organization and management. Surgeon Wasdin then remained on duty as expert in the diagnosis of suspected cases, giving all advice and assistance possible, both in the Home and outside territory.

Second, Surg. J. H. White in executive charge of all measures for the suppression of the disease.

Surgeon White had under his direct command P. A. Surg. C. P. Wertenbaker, who was placed in charge of the cordon; P. A. Surg. W. G. Stimpson, who for a time was his representative in Newport News and subsequently in Hampton in charge of disinfection of mails and of railway cars; Asst. Surg. Von Ezdorf, an immune, who was his representative within the Home and under his orders; Assistant Surgeon Fricks, and a corps of acting assistant surgeons, 15 in

number, appointed from the medical profession in Hampton and Phoebus. Dr. Ileustis Fondé, an expert employed by the Home authorities on my recommendation, was transferred by Major Vickery to Surgeon White's command.

Third, Surg. W. J. Pettus, who had command of the Fort Monroe Military Reservation on Old Point.

Fourth, P. A. Surg. A. C. Smith at Norfolk, keeping Bureau informed as to conditions and transactions there by the local board of health, and acting as agent for the Bureau in forwarding supplies to Hampton. Dr. Smith also had supervision of Craney Island, an island near Norfolk and Portsmouth, recently transferred to the Marine-Hospital Service by the Navy Department. It was used for the housing of refugees from the Soldiers' Home and Hampton discovered through the outside inspection. Acting Assistant Surgeon McClure was in charge on the island.

Fifth, Acting Asst. Surg. R. R. Farquhar at Portsmouth and Berkeley, acting in conjunction with the local boards of health, keeping the Bureau informed as to conditions in those cities and inspecting surrounding territory.

Sixth, P. A. Surg. G. M. Magruder at Richmond, Va., in charge of inspection both at Richmond and Newport News and contiguous territory, assisted by Acting Asst. Surg. Frank Donaldson.

Seventh, Acting Asst. Surg. Arthur Snowden at Alexandria, Va., inspecting all passengers from the yellow-fever district for the protection of Alexandria and Washington.

Eighth, Acting Asst. Surg. John Archinard, expert diagnostician, held in readiness to be sent to determine any suspected case in the outlying territory and himself inspecting various points in Virginia.

From the start the Bureau was given a free hand and all the responsibility. The attitude of Col. P. T. Woodfin, governor of the Soldiers' Home, and of Maj. R. S. Vickery, surgeon at the Home, was all that could be desired, and the following letter was received from Gen. W. B. Franklin, president Board of Managers of the National Home for Disabled Volunteer Soldiers:

THE NATIONAL HOME FOR DISABLED VOLUNTEER SOLDIERS,

Hartford, Conn., August 2, 1899.

DEAR SIR: This will be handed to you by Col. A. J. Smith, assistant inspector-general, N. H. D. V. S., whom I have directed to at once proceed to the Home to attend to such matters as may require attention there and to place himself in communication with you for the purpose of offering you any aid that you may require in your arduous task. He has full authority from me to assume all requisite authority as if the orders were given by me and to act in all matters in concert with you.

Very respectfully, yours,

W. B. FRANKLIN,

President Board of Managers,

National Home for Disabled Volunteer Soldiers.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE,

Washington, D. C.

The board of health of Hampton, Va., and Elizabeth City County, Va., on July 31 passed a resolution turning over to Surgeon White, as the representative of this Service, complete control of all quarantine matters for the time being.

The War Department rendered assistance by directing that no vessel be allowed at the Government wharf, Fort Monroe, unless upon order of Surgeon Pettus, and by Bureau request, through the Secretary of the Treasury, the Secretary of War instructed by telegraph the military commander at Fort Monroe to place all quarantine measures relating to the reservation in the hands of the Marine-Hospital surgeon under direction of the Surgeon-General. It will be remembered that there were several hundred guests in the two hotels, the Chamberlin and the Hygeia, and two companies of artillery forming the garrison of Fort Monroe. It was early determined by the military authorities to remove the garrison; and as it was not improbable that some of the troops had been exposed to infection, the locality first selected to which they were to be removed—namely, Ballast Point, near Delaware City, Del.—was considered unsafe and liable in the event of yellow fever appearing among the troops there to require the same vigilance and a duplication of measures which were being enforced at Fort Monroe. I therefore wired as follows to General Merritt:

[Telegram.]

WASHINGTON, August 1, 1899.

Major-General MERRITT, U. S. A.,

Governors Island, New York:

Have just received information which makes it certain that Delaware Point is too far south for the troops from Fort Monroe. If they go there, will have to be held under observation, and risk is too great to be taken. Respectfully urge you to order them to Plum Island, where it would be safe. Have wired quarantine officer, Fort Monroe, to hold boats when they arrive, pending change of order. Kindly assist us by making the change.

WALTER WYMAN,
Surgeon-General, M. H. S.

[Telegram.]

WASHINGTON, August 2, 1899.

Maj. Gen. W. MERRITT, U. S. A.,

Commanding Division of the East, Governors Island, New York:

Information referred to relates to territory between Soldiers' Home and fort. Plum Island very desirable, and I consider it imperative.

WYMAN,
Surgeon-General, M. H. S.

In response to the representations made, the troops were moved to Plum Island.

Valuable aid was given to Surgeon Pettus by Colonel Guenther, the commanding officer; Surgeon De Witt, and Quartermaster Captain Townsley, in furnishing military guards for the cordon, the comman-

dant's steam launch and crew, and otherwise. The Quartermaster-General of the Army also rendered valuable aid in furnishing and shipping 1,000 tents, mattresses, etc., for use at the Home, in placing the inmates in camp, and emptying the barracks. The Secretary of the Navy, by request (through proper channels) of the Marine-Hospital Bureau, directed the commandant of the Norfolk Navy-Yard to send a steam launch with a detail of ten men to report to Surgeon Pettus for patrol duty. The revenue cutter *Windom* was ordered to Norfolk, and assisted materially in transporting officers and otherwise. The railroad and steamship lines connecting with Old Point acquiesced cheerfully in the restrictions imposed, the Norfolk and Washington Steamboat Line in particular aiding in the inspection of all its passengers, and the Chesapeake and Ohio Railway furnishing special trains for carrying to other points the guests of the hotels at Fort Monroe under the restrictions imposed by Surgeon Pettus. The representative of this railroad company in Washington, Mr. W. H. Greigor, called personally at the Bureau to give information as to a desirable site for a possible detention camp, which it was thought at one time might be necessary; and although a favorable course of events obviated this necessity, the declaration of Mr. Greigor is worthy of mention, namely, that while the establishment of such a camp on the line of his road would be seriously detrimental to its interests, still, in view of the public necessity, he would give all needed aid to the Bureau in its establishment and his road would cheerfully give all other assistance possible.

The daily press published the list furnished by Major Vickery of the members of the National Soldiers' Home who had been furloughed on and after July 22, together with the cities to which they had gone, and a request from myself that medical officers should hold under close observation for a period of ten days such of the inmates as they might be able to find. Special telegrams to the same effect were sent by myself to the health officers of the localities named, twelve in number. Fortunately most of these men furloughed had gone to Northern cities.

It is in large measure due to the full control at and around the immediate source of infection and the frank acceptance of reports accorded to the Service that the Service was enabled to so thoroughly and effectively eradicate the infection.. No case occurred, after the Service took charge, which had not received its infection prior thereto.

The limitation of the spread of the disease within the Home itself to the relatively small number of 43 cases (of which 13 died) is unquestionably due to the prompt recognition by Surgeon Vickery that he had to deal with some infectious disease, though it did not appear at first to be positively yellow fever. Governor Woodfin and Major Vickery working in harmony caused the effects of all the sick to be

sunned and aired rapidly, and, as will be shown hereafter, this work has a marked effect in lessening the spread of yellow fever. After the quarantine operations were limited to the cordon around Phoebus and the Home itself, on August 11, the interference with commerce was trivial, and when the quarantine upon Phoebus itself was removed, on August 15, there remained no interference at all with public comfort or with commerce, and while the Home itself was still quarantined, and remained so up to September 9, this involved no serious inconvenience. On that date the last vestige of restriction was removed, and the record stands that within a period of forty days this Service had strangled an epidemic of yellow fever. This is believed to be the most successful work of the kind which has ever been accomplished and, except in the case of McHenry, Miss., in 1898, stands without even an approximate parallel.

Several commendatory notices of the work done by the Service in suppressing this epidemic have been received at the Bureau, and it is worthy of mention that the citizens of Hampton and Phoebus, the most critical points in the field of operations, calling for the greatest activity, firmness, and tact on the part of Surgeon White, were so gratified with his successful service that they presented him with a valuable and suitably inscribed token of their appreciation.

As to the nature of the fever, it may be said that because of its rapid suppression and owing to the restraints which it was still necessary to impose for some time after the last case had been announced, doubt was sought to be thrown upon its nature by nonprofessional persons, eager to have the restraints removed. Some of the most noted experts on yellow fever in the United States saw the cases, including representatives from State boards of health, who were on the ground watching developments, and, as indicated in letters and expressions in the public prints, not one of the physicians who saw the cases expressed the least doubt as to their nature.

As to the origin of the fever, at this writing there may be some doubt. No other source of the infection has been seriously suggested than through the return of the soldier from Santiago, as reported in Surgeon Wasdin's two reports. The facts have been carefully investigated so far as possible. The whereabouts of the soldier were with difficulty ascertained, and having been located in the State of Washington, the medical officer in command at Portland, Oreg., was directed to find him, interview him, and get his statement. As he came from Santiago and the name of his transport was known, a letter was addressed to the medical officer there to ascertain what precautions were taken at the port of departure. The correspondence which follows contains the report of Passed Assistant Surgeon Blue on his interview with the soldier, the signed statement of the soldier himself, and the report upon the matter received from Assistant Surgeon Parker at Santiago. The baggage of the soldier having been thoroughly disinfected at San-

tiago, if it was this which caused the outbreak of the fever at the Home, it must have been reinfected by the soldier himself, who may have developed a mild case of fever after leaving Santiago and thus reinfected his clothing and baggage. It does not seem likely that the fever for which he was treated at the Home could have been yellow fever, for he was too long absent from Cuba to have it develop as a result of infection in Cuba, nor could it have been due to the opening of the baggage which had been disinfected; and if the latter had been reinfected it must have been by the soldier himself, who then would not have had a second attack. The problem therefore does not seem to be solved, but all the correspondence regarding the matter is given herein.

[Telegram.]

WASHINGTON, August 3, 1899.

Dr. RUPERT BLUE,

Marine Hospital, Portland, Oreg.:

William Thomas, a soldier, entered National Soldiers' Home, Hampton, Va., July 2 to 5 from Santiago de Cuba and Manzanillo via New York. One day in Washington; baggage was shipped to Phoebus, a small town adjoining Soldiers' Home. He was taken sick while at the Home. Recovered sufficiently to leave middle or latter part of July. Supposed to be the cause of bunion now prevailing. Wish to verify these statements, getting details of his movements in Cuba and exact dates of departure from Santiago and Manzanillo or any other port, and date of arrival at New York: the name of transport; also what quarantine measures were taken, both in Cuba and this country. Said now to be at Columbus City, Wash., with Mr. J. T. Shirk. Employ temporary acting assistant; visit Columbus City, about 100 miles up the river. Quietly draw out facts, and if possible get signed statement of them and mail. On return to Portland wire substance. Prompt action desired.

WYMAN.

[Telegram.]

SEATTLE, WASH., August 8, 1899.

Dr. WALTER WYMAN, Washington, D. C.:

Found Thomas, Chico, Wash. He left Santiago, Cuba, transport *McClellan* via San Juan, P. R., June 5. All baggage except clothing worn and hat in box disinfected prior to sailing. Nobody allowed ashore San Juan. Arrived New York June 18. No disinfection, no detention there. In New York eight days, at Mills House. Visited Washington, D. C., three days; stopped at 321 Missouri avenue—Mrs. Croft. At Soldiers' Home, Hampton, from June 30 to July 5. Opened baggage there. Had chill or chills July 1; did not take to bed. Returned to New York July 6.

RUPERT BLUE,

Passed Assistant Surgeon.

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Portland, Oreg., August 9, 1899.

SIR: I have the honor to transmit herewith the statement of William Thomas regarding his movements since leaving Manzanillo, Cuba, May 30, 1899. There are some facts, however, not mentioned in his statement which may be relevant

to a study of the conditions arising from his return to the United States. Thomas states that he was in the military hospital at Santiago de Cuba in January and possibly February, 1899, for a sprained knee. After leaving the hospital he accompanied his train of packs to El Cobre, Mayari, and Bayamo, finally reaching Manzanillo. While in Santiago (about June 3) awaiting the sailing of the steamer *McClellan*, he collected a number of curios, namely, a lot of canes, shells, pieces of a Spanish soldier's uniform, and a Cuban "rat," a very large and fine animal about the size of a half-grown opossum. This animal, secured in a wooden box, was taken aboard the steamer, and was the only thing not subjected to disinfection by the "port doctor." He states that the doctor gave him a very careful personal inspection, feeling his pulse, etc. En route to New York from San Juan, the "ship's surgeon" inquired if he intended to go south. He replied in the negative. The transport arrived in New York early in the morning, and the passengers were ashore before noon of the same day. His baggage was taken to the Mills House, in New York; to No. 321 Missouri avenue, Washington, D. C., and to the Soldiers' Home, Hampton, Va., being opened at all these points. The rodent, being friendly and easily managed, was petted and spoiled at the Home. It is timely to mention here another incongruous companion of Mr. Thomas, in the shape of a mammy, the remains of an ancient cliff dweller. He denies, though, having brought this thing from Cuba, and claims that it was in the care of Dr. Vickery, at the Home, during his sojourn in the Tropics. Mummy and rodent are now at the home of J. T. Shirk, Columbia, suburban to Seattle, Wash. I do not believe it possible that the infection of yellow fever could be propagated around Columbia, or Seattle, for that matter, to any appreciable extent. The ground is usually dry at this season of the year, and cold winds are constantly blowing in from the sea. The conditions are similar to those of the coast around San Francisco, except perhaps a little more moisture in the soil at Seattle.

Respectfully yours,

RUPERT BLUE,

Passed Assistant Surgeon, U. S. M. H. S.

Surge. Gen. WALTER WYMAN, *Washington, D. C.*

STATEMENT OF WILLIAM THOMAS.

SEATTLE, WASH., *August 8, 1899.*

This certifies that the following statement regarding my movements in Cuba and the United States since May 30, 1899, is correct.

I left Manzanillo, Cuba, May 30, 1899, on the regular passenger steamer *Maria Christina*, and arrived at Santiago de Cuba twelve hours later. In my company were a number of soldiers and packers, one of them coming from a hospital at Manzanillo. We were three days in Santiago before sailing for New York, via San Juan, P. R., on the U. S. transport *McClellan*, June 5. All my baggage, save the clothing worn at the time, was disinfected in steam prior to embarking. At San Juan no one was allowed ashore, as it was thought by the quarantine officer that some of the passengers might possibly convey smallpox from Manzanillo. We were detained here about five days, and took on board a number of discharged soldiers and a corpse. The port of New York was reached without incident in about five days (June 18). Here we were not detained in quarantine, nor was our baggage disinfected, but we were allowed to go ashore after an inspection by the quarantine officer. I remained in New York City, at the Mills House, about eight days, and then visited Washington, D. C., stopping at 321 Missouri avenue while there. Having business affairs to arrange at the Soldiers' Home at Hampton, Va., and desiring to see old friends, I visited there about five days, arriving June 30. My baggage, consisting of a valise containing clothing, several blankets, a shelter tent, and some curios, including a Cuban rat (in box), and some pieces

of Spanish uniform brought from Cuba, was taken to the Home. I was not sick enough at any time while there to take to bed, but did have a chill, which I attributed to malaria, and for which I requested quinine. This occurred on July 1. I left the Home on the night of the 5th of July, going direct to New York, and soon after leaving for Seattle, Wash., which place I reached July 16, 1899. I know of but two cases of sickness during the entire voyage; one was a case of "cramps" in a soldier at San Juan, and a convalescent soldier was sick about four days with general malaise and vomiting. Both of these men recovered.

Respectfully,

WILLIAM THOMAS,
Formerly Private, Second United States Infantry.

LETTER FROM ASSISTANT SURGEON PARKER AT SANTIAGO.

SANTIAGO DE CUBA, *September 9, 1899.*

SIR: I have the honor to make the following report, as per your request of August 19, 1899:

In my record book of certificates issued I have the following data: Name, William Thomas; age, 52; color, white; previous vaccination, 1899; certificate issued, June 7, 1899.

As there was no regular yellow fever reported in Santiago at that time, the following was the method of treatment:

Transportation was issued by the quartermaster, United States Army, in charge of ocean transportation, to those having my certificates, up to a certain hour, then those having transportation were taken on board the *Rough Rider* and disinfected. All loose fabrics were steamed, trunks formaldehyded by sprinkling; if these contained blankets or bedding they were steamed. While the articles were in the chamber the soldiers went on a lighter alongside, and when finished their effects were passed to them. The lighter was then taken to the transport and only those on it were allowed on board.

I do not remember Thomas individually, but his statement that his pulse was felt must have been due to his general appearance, indicating a febrile condition. Many of these men had evidences of, gave a malarial history, and were treated in this office. Specimens of blood were examined by Dr. Rosenau, who preceded me, and by myself, the diagnosis being made in that way. There is no doubt, however, that yellow fever existed here at that time and that the men were exposed to the same virulent infection that manifested itself so markedly ten days later.

Respectfully yours,

HERMAN B. PARKER,
Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

CHRONOLOGICAL SUMMARY AS PUBLISHED WEEKLY IN THE PUBLIC HEALTH REPORTS.

Following is a daily record of events as they were published at the time in the weekly Public Health Reports for August and September:

[From Public Health Reports of August 4, 1899.]

YELLOW FEVER IN THE SOLDIERS' HOME AT HAMPTON, VA.

Late Saturday evening, July 29, a telegram was received from Major Vickery, surgeon, United States Army, requesting that an expert be sent to examine suspicious cases of sickness in the Home. Surgeon Wasdin was immediately ordered

there from Norfolk, and at 9 o'clock of the evening of the 30th his telegraphic message was received announcing that the cases were yellow fever.

Surg. J. H. White was at once ordered from Washington to Hampton to take charge of Service affairs. Surgeon White has had large experience in yellow-fever epidemics, having been in charge of Camp Fontainebleau, Miss., in 1897, and later of Camp Hutton, Avondale, La.

Surgeon Wasdin wired that a cordon had been established around the Soldiers' Home, this being the first measure necessary in establishing quarantine. The matter of next importance was to warn neighboring cities and advise them to look up any inmates of the Home who might be visiting and to keep them under close observation.

Telegrams to this effect were accordingly sent the same night (30th) to Norfolk, Portsmouth, Newport News, Richmond, and to Health Officer Woodward, of Washington, D. C. Acknowledgments have been received, and the search for people recently from the Home or from Hampton is going on. In Norfolk the health officer telephoned that a house-to-house inspection was being made. Dr. Farquhar, at Portsmouth, was appointed to consult with health authorities there and of the adjoining town of Berkeley and to aid in locating refugees. The same night Passed Assistant Surgeon Wertenbaker was ordered from Wilmington, N. C., to Hampton. He is not an immune, but intimately acquainted with the locality, and will serve on the outside of the cordon. Surgeon Wasdin was also ordered to guard Phoebus, a town near Hampton.

Surgeon Vickery was telegraphed, offering assistance and requesting him to prepare a list of members of the Home who had departed within a month, with destinations, to assist in tracing them, and to give this list to Surgeon White.

July 31 (Monday), Assistant Surgeon von Ezdorf ordered from New Orleans to Hampton. He is immune, and has had experience in epidemic work.

Passed Assistant Surgeon Smith, on leave, was directed to rejoin his station—Norfolk—and Passed Assistant Surgeon Magruder was ordered from Memphis to Hampton. Both these officers have had large quarantine experience.

Surgeon Pettus, in command of Cape Charles Quarantine, has been ordered to assign his assistant, Dr. McClintic, to temporary command, and himself to remain on duty at Old Point.

August 1: Orders were given by the Secretary of War that no vessel be allowed at Government wharf, Fortress Monroe, unless upon order of the Government officer there, Dr. Pettus.

The Secretary of the Treasury requested the Secretary of War to telegraph instructions to the commandant of the military reservation at Fortress Monroe, directing him to place all quarantine measures relating to the reservation in the hands of the officer of the Marine-Hospital Service at Old Point, under the direction of the Supervising Surgeon-General Marine-Hospital Service, and instructing him to comply strictly with the Treasury regulations. This was done.

August 2: Acting Assistant Surgeon Farquhar was directed to keep a lookout for persons from Hampton and Phoebus, sending any who might be discovered to Craney Island for detention.

Surgeon Wasdin telegraphs for the day ended August 1: Three new cases at the Home and 1 death, making in all 40 cases and 8 deaths. One suspicious case in Phoebus. House-to-house inspection of Phoebus is being conducted.

Governor Woodfin telegraphs: All favorable at the Home; Wasdin giving valuable assistance.

In response to Surgeon Vickery's request for immune physicians and nurses, Assistant Surgeon Von Ezdorf, Acting Asst. Surg. I. G. Tuten, and Acting Assistant Surgeon Fonde, 2 male and 2 female nurses, were sent him.

Surgeon White has arranged for the disinfection of all mail from the Home

and from Phoebus, and the Post-Office Department for the disinfection of mail from Hampton and Old Point.

The Kensington Engine Works were requested to ship to Pettus at once 2 autoclaves, and the medical purveyor was directed to ship him 2 carboys of formalin and 2 of formalin mixture for disinfecting.

August 3: On request, the chief of the Revenue-Cutter Service has directed the steamship *Windom* to proceed from Baltimore to Norfolk, in order to transport supplies from Norfolk to Old Point by way of the *Jamestown*.

Passed Assistant Surgeon Magruder ordered to Richmond for duty, and Acting Asst. Surg. Frank Donaldson ordered to report to him, the two to inspect towns between Richmond and Newport News. Passed Assistant Surgeon Stimpson was ordered to Newport News and to report by wire to Surgeon White, and Assistant Surgeon Frick and Hospital Steward Kolb were also directed to report for duty to Surgeon White.

August 4: Surgeon Wasdin telegraphs that tents are being erected, and by the 5th enough will be erected to accommodate 1,500 persons. The old soldiers will be moved into these and their quarters disinfected.

[From Public Health Reports of August 11, 1899.]

August 4: Surgeon Wasdin reports 2 deaths at the Home to-day; no new cases; no new cases in Phoebus; house inspection not finished.

August 5: Surgeon Wasdin reports, after conference with General McMahon and Colonel Smith, the situation reassuring, and that inmates from all infected dormitories can be tented by the 7th. No new cases to-day; 1 death. Total to date, 42 cases and 11 deaths. Disinfection begins to-night.

Surgeon Pettus reports the departure of the troops from Fortress Monroe on the steamship *McClellan* for Plum Island at 3.50 p. m.

Attendant Lindgren, who has practical knowledge of disinfection, is ordered from the hygienic laboratory to report to Surgeon White for duty as disinfecter at the Home. Two immunes from New Orleans are also ordered to the Home for the same purpose.

Surgeon White, in command of the campaign at Hampton, reports on the situation as follows:

MARINE-HOSPITAL SERVICE,
OFFICE OF MEDICAL OFFICER IN COMMAND,
Hampton, Va., August 5, 1899.

SIR: I have the honor to report that the situation here to-day is, to the best of my knowledge and belief, as follows:

The guard around the Soldiers' Home and the outer line surrounding the community known as Phoebus is effective, and the only coming and going through this line is that involved in the transportation of supplies to the people of the inside community by means of wagons, whose crews are relayed at Hampton Bridge. The normal school, which is within the Phoebus district, though not a part of the town of Phoebus, being distant a mile therefrom, has liberally cordoned its own grounds, and in so doing has strengthened the Service cordon to that extent, the school lying partly between Soldiers' Home and Hampton and partly between Phoebus and Hampton.

Passed Assistant Surgeon Wertenbaker is preparing a chart showing the relative position of the points involved in this quarantine and location of the cordon. The expense of maintenance of these cordons is large, but, I believe, justified. Surgeon Wasdin, Acting Assistant Surgeon Vanderslice, and Acting Assistant Surgeon Reed are engaged in a house-to-house inspection in Phoebus, and arrangements have so far progressed on this side that I expect to begin a similar process in Hampton to-morrow morning.

I am informed by Assistant Surgeon Von Ezdorf that the outlook for a proper segregation of the old soldiers is improving.

So far as the control of transportation is in my power, this portion of the necessary arrangements has been satisfactorily arranged. But so timid is the outside population that they refuse to admit empty flat cars in the outside communities for the purpose of bringing in freight. I hope, however, to soon be able to adjust this difficulty.

It is my opinion that after the completion of his present assignment to make arrangements for the inspection of outside territory as to drift, the service of Passed Assistant Surgeon Magruder will be extremely valuable at this point, and I trust that he may be ordered here. There is an infinity of small details to be attended to which are absolutely beyond the capacity of one or even two men, even if both are possessed of inexhaustible patience and ingenuity. Dr. Wertenbaker's time is entirely employed and entirely needed in seeing that the guard lines are what they should be, and consequently everything else falls upon me, and it is for this reason that I ask for Dr. Magruder, in whose judgment and discretion I have entire confidence, and with whom, therefore, I would be willing to share the responsibility of the discretionary work.

Respectfully, yours.

J. H. WHITE,
Surgeon.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

August 5: On request of the Secretary of the Treasury, the Secretary of the Navy directed the commandant of the Norfolk Navy-Yard to send a steam launch with 10 men to Surgeon Pettus to assist in patrol duty. This was done.

August 6: Surgeon White reports that the United Charities are feeding the people of Phoebus, but their funds are nearly exhausted. House-to-house inspection of Hampton to begin to-day.

August 7: Surgeon Vickey telegraphs: "One new case admitted to hospital to-day; was sick six days; no deaths."

Surgeon White reports the satisfactory progress of the house-to-house inspection of Hampton.

Acting Assistant Surgeon Donaldson reports, after investigation, Yorktown, Grafton, and surrounding country between Grove Station and Newport News entirely clean.

Surgeon Pettus reports the continuation of Norfolk's quarantine against Hampton and Old Point, and that it will probably continue four days longer. Arrangements were made looking to the establishment of a detention camp on Fishermans Island. Hospital Steward Richardson was ordered to report to Passed Assistant Surgeon Smith at Norfolk, preparatory to going to Fishermans Island, should the camp be established.

Passed Assistant Surgeon Magruder reports no new developments at Newport News. Inspection began on the 6th under Dr. Hobson.

August 8: Passed Assistant Surgeon Magruder reports inspection at Newport News progressing well; will be completed by the 9th; then a second inspection will be begun, and this plan will be continued till the epidemic ends.

Acting Assistant Surgeon Farquhar reports no yellow fever or suspects in Berkeley; no yellow fever in Portsmouth, but 1 refugee found there yesterday (7th) was sent to Craney Island.

Acting Assistant Surgeon Donaldson reports that a house-to-house inspection of Riverview and the district between Hampton and Newport News shows the district entirely clean.

Surgeon Wasdin reports that Von Ezdorf and Tuten are on duty in the Home; that 2 hospital tents are now erected for use as an intermediate hospital, should it be necessary on account of spread of the disease. Three dormitories are now

empty and being fumigated, the infected mattresses burned, and 1,300 inmates have been placed in tents.

August 9: Surgeon Vickery reports: "No change; everything favorable; nearly all in the tents that can be moved. Disinfection of buildings pushed along by Von Ezdorf."

Report of the detention camp at Craney Island is as follows:

August 4: Six suspects found in Berkeley sent to Craney Island. Four refugees found in Portsmouth. Received, 13; on hand, 13; all well.

August 5: Received, 5; discharged, none; on hand, 18; all well.

August 6: Received, 2; discharged, none; on hand, 20; all well.

August 7: Received, 1; discharged, none; on hand, 21; all well.

August 8: Received, 2; discharged, none; on hand, 23; all well.

August 9: Acting Assistant Surgeon Archinard, having been ordered to Petersburg, Va., to look out for suspects, reports as follows:

"I have the honor to report that I am still at Petersburg, overlooking the sanitary condition. From information gathered from the health officer and others I do not believe that there exists any chance of yellow fever making an appearance in this locality. I will continue my inquiries relative to the conditions here until I hear from you."

August 9: Surgeon White reports that the last in Phoebus has been furnished new clothing and discharged. No remaining foci, and disease confined to Soldiers' Home. House-to-house inspection at Hampton completed; shows nothing suspicious.

August 10: Acting Asst. Surg. John Archinard is ordered to proceed immediately to West Point on York River and work backward from that point to Richmond, stopping off at principal towns or hamlets to ascertain if there are refugees from Phoebus or Soldiers' Home, and if any suspicious cases are among them to wire his arrival at West Point and departure therefrom, and also to wire daily his whereabouts, and on return to Richmond to report for orders.

Acting Assistant Surgeon Farquhar is ordered to Suffolk, Va., with a view to locating any refugees from Phoebus or Soldiers' Home, and to make sure Suffolk is clean. Thence he is to go to Belfield Junction and Emporia for same purpose, and work back from Emporia to Portsmouth, stopping at such points as he thinks should be inspected, investigating rumors and reports and keeping Bureau informed daily by telegraph.

August 10: Surgeon White telegraphs as follows:

"Conference [authorities of Newport News, Norfolk, Hampton, and Virginia State board] wants assurance that Boston, New York, Philadelphia, and Baltimore will not quarantine Norfolk, Portsmouth, Newport News, and Old Point if quarantine on Hampton is raised. I certify that Hampton is not infected and has been most thoroughly inspected, house to house, with no results. Please ascertain status of New York and other cities and wire results to boards of health interested. It is useless exposure and hardship to quarantine Hampton, and prompt action will be appreciated by all."

Accordingly the health authorities of the cities mentioned were telegraphed:

"Conference of the local health officers request me to obtain assurance that Boston, New York, Philadelphia, and Baltimore will not quarantine against Norfolk, Portsmouth, Newport News, and Old Point if the quarantine on Hampton, Va., is raised. Surgeon White, Marine-Hospital Service, who has been at Hampton since outbreak, certifies that Hampton is not infected, and has been most thoroughly inspected with house-to-house inspection, with no suspicious cases found. He states that it is useless exposure and hardship to quarantine against Hampton. This village is from 1 to 2 miles from the National Soldiers' Home, where outbreak occurred. A strong cordon, under Marine-Hospital Service, surrounds the Home

and the town of Phoebus, adjoining the Home, on the side farthest from Hampton. Phoebus is also now free from disease, as shown by house-to-house inspection. No new cases or deaths in Home for several days. There is no reason known to me for quarantining against any other places than Phoebus and National Soldiers' Home. I will promptly inform you should any new cases appear. Kindly wire me whether you will give the assurance requested or not.

"WYMAN, *Surgeon-General*."

Favorable responses were received from New York and Baltimore. No replies have yet been received from Boston and Philadelphia.

August 11: Surgeon Vickery telegraphs that the situation continues favorable, 1 death not from fever. 1 suspicious case isolated. Fourteen hundred and twenty men in tents; disinfection going on well.

[From Public Health Reports of August 18, 1899.]

August 10: Surgeon White reports that inspections will be continued in Phoebus, that physicians are reporting all cases, and all are being investigated. Newport News has abolished her quarantine, but the other towns are awaiting the assurance that Boston, Baltimore, New York, and Philadelphia will not quarantine against them. Phoebus and the Home are well guarded.

August 11: Surgeon Magruder reports from Newport News that nothing suspicious was found at Williamsburg. Reinspection of Morrison and adjacent points shows condition satisfactory.

Acting Assistant Surgeon Archinard reports that all points between West Point and Richmond have maintained a strict quarantine against Phoebus, Hampton, and the Soldiers' Home, and there need be no fear along these points. No refugees found.

Acting Assistant Surgeon Farquhar reports, after a thorough investigation, no refugees found in Suffolk.

Crane Island.—August 9: Received, none; discharged, 4; on hand, 19; all well. August 10: Received, none; discharged, 6; on hand, 13; all well. August 11: Received, none; discharged, 1; on hand, 12; all well. Passed Assistant Surgeon Smith reports that all guests will be discharged to-day, and all guards to-night.

August 12: Surgeon Vickery telegraphs: "All favorable: no new case and no death. Last suspicious case not the fever."

August 13: Acting Assistant Surgeon Farquhar reports that he has inquired at Belfield, Emporia, and Gaines River Junction, and found no refugees. He goes to Franklin to-night, and Monday (14th) to Portsmouth, Va., it not being necessary to visit any other towns along the road.

Surgeon Vickery, of the National Soldiers' Home, telegraphs: "Condition continues good; over 1,500 in tents."

Surgeon Pettus, at Fort Monroe, reports that all guards except 3 have been discharged, but that it is necessary to keep up launch patrol till Phoebus is out of quarantine.

Acting Assistant Surgeon Archinard was directed, if satisfied with conditions between West Point and Richmond, to proceed to Danville and work back to Richmond on line of the Southern Railroad, making inquiries at Danville, using his judgment as to what places he should stop at and make inquiries, wiring arrival and departure from each place.

INSPECTION SERVICE AT ALEXANDRIA.

ALEXANDRIA, VA., *August 12, 1899.*

SIR: According to instructions received from you, from August 2 all passengers from yellow fever infected and suspected districts were kept under personal observation. Owing to the fact that passengers coming north stopped in Rich-

mond, it was difficult to ascertain their point of departure. There were in all 14 arrivals from Newport News, Hampton, and vicinity. All were kept under surveillance except 1 supposed inmate of the Home, who disappeared August 2 and could not be located, as he left the city after spending the night in a lodging house.

No sickness of any kind has developed among these refugees.

Very respectfully,

ARTHUR SNOWDEN,
Acting Assistant Surgeon, U. S. M. H. S.

August 13: Surgeon Magruder is directed to proceed to Richmond, and remain on duty there probably during the week, wiring the Bureau if he thinks necessary to visit any other place. He is directed to locate Acting Assistant Surgeon Donaldson, in Newport News, for inspection purposes.

August 14: Acting Assistant Surgeon Farquhar reports, after investigation, no refugees in Franklin, Va., and that he leaves for Portsmouth, Va., in the afternoon.

Surgeon Wasdin relieved from temporary duty at Norfolk and directed to report at Bureau for special temporary duty.

Surgeon White reports the beginning of another inspection of Phoebus to-day.

Acting Assistant Surgeon Archinard reports his arrival at Danville, Va., and that he will report after investigation.

August 15: Surgeon White reports the completion of the inspection of Phoebus and is authorized, as requested, to discontinue the cordon around Phoebus and to maintain a strong cordon around the Soldiers' Home.

Dr. Newbill, president of the board of health of Norfolk, was telegraphed as follows:

"I have approved Surgeon White's recommendation to remove cordon around Phoebus and maintain strong cordon around Soldiers' Home. Phoebus has been practically a detention camp for two weeks, and pratique to its inhabitants can not now be refused. Dr. White, after repeated and almost continuous inspections, declares it is absolutely not infected, judging by all known means of investigation. Conference this afternoon unanimous in favoring immediate relief for Phoebus."

The same telegram was sent Dr. Hope, quarantine officer, Portsmouth, Va., and Dr. Brice, board of health, Portsmouth, Va.

Surgeon Vickery telegraphs from the Home that all is favorable, and that some men are moving back from tents to the quarters which have been disinfected.

Passed Assistant Surgeon Smith reports as follows concerning his work in Norfolk in connection with yellow fever:

NORFOLK, VA., *August 14, 1899.*

SIR: I have the honor to report that since rejoining this station, August 3, I have had occasion to examine one case of sickness and to attend one post-mortem examination, with reference to the disease yellow fever, and found nothing to indicate the existence of that disease in either case, the investigations having been made merely as a matter of caution. I have inquired of the president of the board of health and do not learn that any other cases of sickness have occurred in the city of a nature to call for investigation or special examination.

I report these facts as a part of the work of the Service at this station, which would not appear in any other form.

Respectfully, yours,

A. C. SMITH,
Passed Assistant Surgeon, U. S. M. H. S.

[From Public Health Reports of August 25, 1899.]

August 16: Surgeon White reports that guards were removed at midnight from Phoebus. All is peaceful; no rumors nor foundation for any. Newport News and Norfolk satisfied.

Surgeon Pettus reports the patrol by launches stopped this morning, and that he will return the launch lent by Admiral Farquhar as soon as the storm quiets down.

Passed Assistant Surgeon Wertenbaker relieved from duty at Fortress Monroe and ordered to rejoin his station, Wilmington, N. C.

Acting Assistant Surgeon Archinard reports, after inspection of points between Burkville and Danville, Va., no refugees and nothing suspicious.

Acting Assistant Surgeon Farquhar reports no suspicious cases in Portsmouth or Berkeley.

August 17: Passed Assistant Surgeon Smith is ordered to Hampton to relieve Surgeon White.

Acting Assistant Surgeon Farquhar reports that Berkeley has raised the quarantine from Phoebus. Portsmouth still quarantined against Phoebus. No suspicious fever cases in either place.

August 18: Surgeon Vickery reports from the Soldiers' Home that all are doing well and the disinfection is going on.

The services of Acting Assistant Surgeons Archinard and Farquhar, being no longer needed, are discontinued.

August 19: Surgeon Vickery, of the Soldiers' Home, having been requested to report the number of cases now on hand and date of detection of last case, replies as follows: "Twenty-two cases in ward; most of them ready to be discharged. Nine in the convalescent ward. The last case occurred August 7."

He reports 1 death from one of the first cases. No new cases.

August 20: Surgeon White is ordered to turn over Service matters at Hampton to Passed Assistant Surgeon Smith and return to his station (Washington).

August 21: Surgeon Vickery reports the same encouraging conditions, and that the men are getting back into the building.

[From Public Health Reports of September 1, 1899.]

August 24: Surgeon Vickery telegraphs that disinfection is advancing rapidly, and that Dr. Tuten left to-day.

August 26: Surgeon Vickery reports that both immune surgeons are gone, and 200 hospital patients are in tents for the disinfection of their quarters.

[From Public Health Reports of September 8, 1899.]

September 1: Surgeon Vickery telegraphs that the hospital patients have been moved to tents, the building is being disinfected, and the last fever case discharged.

September 3: Assistant Surgeon Von Ezdorf reports: Inspected all sick; found no suspicious cases. Medical inspection of all inmates of Home this morning showed general health excellent. Disinfection complete in 23 buildings of 2,590,009 cubic feet. Hospital requires bichloriding of floors of rooms; fumigated. About 400 men in tents.

September 5: The health officers in the vicinity of Hampton are informed that limited egress will be allowed from the Soldiers' Home on the 7th instant, and all restrictions will be removed on the 9th. Ingress prohibited until the 15th. In accordance with this, Assistant Surgeon Von Ezdorf, at Hampton, is directed to remove guards on the 9th at 6 p. m. and to pass a limited number of Home officers and employees as early as Thursday on governor's request. He, the governor, agrees to prevent visitors entering the Home till the 15th, and limit same later. Von Ezdorf is ordered to confer with the governor.

[From Public Health Reports of September 15, 1899.]

September 10: Assistant Surgeon Von Ezdorf reports as follows:

I have the honor to state that the guards were promptly removed at 6 p. m. yesterday, in accordance with instructions contained in Bureau telegram dated

September 5, 1899. The conditions at the Home remain the same. Governor Woodfin informed me this morning that he would limit the issuance of passes to 6 for every 100 inmates instead of 6 for each company, as previously reported. He is refusing the admittance of any visitors, and is retaining his guard at the entrances to the Home. No one is leaving the Home reservation except by permit.

Subjoined are the reports of Surgeon Wasdin, who was detailed as expert diagnostician:

PRELIMINARY REPORT OF SURGEON WASDIN.

NORFOLK, VA., *July 30, 1899.*

SIR: In compliance with your telegraphic order of the 29th (yesterday), I have seen all the cases of suspected disease at the National Soldiers' Home at Hampton, Va. Major Vickery gave me every opportunity. To-day the history of contagion seems complete; it is being compiled and will be sent later. It may be summarized as follows: Early in July an "old soldier" entered the Home for a short rest, and soon after appeared at the dispensary, where he informed the physician in charge that he was but recently from Santiago de Cuba via a transport to a northern port; thence he started for Manila via San Francisco, "beat" his way to the Home on a freight train, and entered with his baggage. He complained of dumb chills and fever and was prescribed for. He mingled freely with the inmates of the Home. He disappeared a short time ago. From this, as a possible cause, the outbreak is as follows:

Preceding Friday, the 21st instant, there had been noticed nothing of a suspicious nature. The weekly death rate was as usual. But on the 21st and 22d there became ill during the night, with sharp or less chill and high fever, some 8 or 10 of the inmates, men of usually good health. These seizures, although noted as peculiar, occasioned no alarm until about Thursday, the 27th, when a death occurred, the man becoming distinctly yellow some time prior to death. On or about the same day another one died without having attracted particular medical attention. He also turned quite yellow. Necropsies were performed on both by a resident pathologist. It was then, or a little later, that the telegram was sent to you asking for an expert. On my arrival I found that there were more than 3,500 inmates, and that 35, or 1 per cent, had been taken ill since the 21st. Of these, 4 have died. One was at 12 m. moribund, and 3 others were desperately ill, and I believe will die. A number of the sick are convalescent, and a number are much more recent admissions to hospital. There is an area of infection not strictly defined in and about certain dormitories, although several cases have recently been admitted from a more distant dormitory. I can not ascertain as yet whether or not the soldier slept in the first-mentioned dormitory. A very strict search was made on Friday and Saturday in all dormitories to detect cases, and all (31) were isolated in a large ward. In spite of this careful search in the dormitories, 1 man was admitted to hospital ward last night and died at 3 a. m. The general symptoms have been a sharp chill at night or early in the morning, followed by fever; much pain in head and back and in the legs; nausea and vomiting have been pronounced; almost invariably there has been and continues to be much epigastric pain, heaviness or uneasiness; in 1 case to-day vomit has been very free and gums have been swollen; in 1 case I saw epistaxis; on the third or fifth day icterus has come on generally; in a few cases it has been present to a most marked extent, eyes and skin being golden; eyes generally injected and facies congested. In a number of cases (9 to-day) albumen is present in appreciable quantities; in all the serious cases uræmia is developed; there are several almost anuric; bowels constipated, spleen normal on palpation. I withheld a positive diagnosis last night because of the assertion of Surgeon Vickery that there had been no communica-

tion of the inmates with any Cuban soldiers returned since last May or early in June. With the discovery of the probable origin of the infection and the 2 necropsies to-day (for which I also wished to wait), there can be no doubt of the disease being yellow fever. I have advised Major Vickery to empty the dormitories infected at once, putting the men preferably in tents. The grounds are closed to ingress and against egress. There has been, as usual here, a very free intercommunication between the inmates and the people of the adjacent village of Phoebus, a public house near the grounds having been freely visited until last night. I have suggested to Dr. Pettus to meet one or more of the local health board, and, informing them of the status of affairs, ask their cooperation in watching the village. The inmates of the Home, as I understand, do not mingle with people outside of this village. From this fact it would seem possible to confine the disease to the Home. I mail this on board the steamer in order that you may have all the facts at an early hour to-morrow.

Respectfully, yours,

EUGENE WASDIN.
Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

FINAL REPORT OF SURGEON WASDIN.

WASHINGTON, D. C., *August 21, 1899.*

SIR: In compliance with your telegraphic order of July 29, p. m., I proceeded to the National Soldiers' Home and conferred with Major Vickery, the surgeon in charge, and saw some of the cases of sickness that had caused his alarm. The cases examined gave evidence of yellow fever, and since two were practically moribund, I determined to await autopsy of them before wiring you my decision.

As to infection, I could gain no information from Surgeon Vickery that night, but he led me to infer that there had been no recent communication between the inmates and possible contagion; in fact, not since the early spring, when there had been such communication with soldiers recently returned from Cuba. This seemed very remote. Early on Sunday, the 30th, I again saw all the cases and witnessed several autopsies, which clearly indicated the cause of death. My conclusion was concurred in by the authorities of the Home, and they at once took steps to limit the infection.

My inspection was finished by noon of the 30th, but, being Sunday, I could not wire you until my return to Norfolk at 3 p. m.

The cases I saw were collected in one large ward from the different barracks in which they had originated and were thus isolated from all others. The history of the attack was very nearly the same in each case. There was at first a more or less sharp attack of chill at night, followed by fever of a continued type; pain in head and eyes and back and limbs; nausea was very frequent, and in some incessant vomiting was a feature; in all there was a marked heaviness and painfulness in the pit of the stomach and over the hepatic region; the spleen was never enlarged; there was no eruption; the eyes were, in many, icteroid, with marked vascular fullness of the conjunctive; facies rather dull or indifferent (in all there was profound depression); in many facial subsultus was present, also of the hands and arms and diaphragm; the skin, in cases three and four days old, was icteroid; there was diminished urine and the presence of albumen in appreciable quantity. There were but meager pulse and temperature records, owing to the sudden demand upon the medical staff, but there was sufficient evidence of the early fall of the pulse rate, even when the temperature was rising. At post-mortem the external and internal appearances of the dead bodies confirmed the opinion that the disease was yellow fever. The pronounced yellowness of the skin and eyes, with the

characteristic hypostasis of face, neck, and chest and dependent parts, was confirmed by the increased vascularity of the organs within the body; the fullness of the vasa-vasora of the aorta and other great vessels; the extravasations in the serous membranes: the softening (fat) of the myocardium; the fatty changes in the liver and kidneys; the hemorrhagic condition of the mucosa of the stomach and duodenum; the presence of "black vomit," and the absence of urine from the bladder.

As to the means of their infection, I was informed on the 30th that there was a rather clear case of convection in the clothes or belongings of one William Thomas, an old inmate of the Home, who had gone to Cuba in some minor capacity in our Army and had returned to the United States. Although this man gives a straightforward history and one of disinfection at Santiago de Cuba prior to sailing on the transport *McClellan*, there is no possibility of error in his statements that he became ill in the Home on July 2; was treated for "malaria;" felt better, and wandered away and to the Pacific coast. He was not entered at the Home and was not discharged therefrom at this visit. He was ill in the Home from the 2d until the 6th, when he left. Just ten days after this, on July 16, the first case occurred among the inmates and soon thereafter others, for prior to July 21 there occurred two deaths at least, with the history of the bodies becoming yellow. On the 21st a number of the soldiers came down with the same illness, which now commenced to attract the attention of the physician. On or about the 26th two autopsies were made by the pathologist of the institution, who afterwards informed me that black vomit was found in the stomachs. Here, therefore, are presented the very probable mode of entrance of the infection to the Home; the clinical history of yellow fever, and the autopsic appearance of the organs of bodies dead of the disease.

Peculiar features of the outbreak are its appearance in several barracks at the same time, the number attacked in a short period, and the subsidence of the outbreak. In all there were 42 cases and about 14 deaths. I am disposed to believe that there were a number of other cases of mild type which were not recognized. One man concealed his condition until it was revealed on the discovery of his dead body at reveille one morning. This body I saw autopsied, and was typically one of yellow fever. It was known that the inmates hid their ailings during this time in order to escape going to hospital. It is idle to estimate the number of light attacks.

The free communication of the people of the Home and the people of Hampton and Phoebus was a matter of much concern, since from the poor sanitary conditions of these towns an epidemic of some magnitude might have been there started. Early in the outbreak one man in Phoebus, a policeman, frequently in contact with the Home inmates, and whose residence is very near the boundaries of the Home, became ill, a chill occurring on the night of Monday, July 24; was in bed and sick until the 28th or 29th, and when I saw him on the 31st was much prostrated, and from the appearance of eyes and skin and pulse and urine (bile) I determined that he was sufficiently suspicious to warrant me in asking the local health officer to limit the going and coming from the premises until the proper officer should quarantine the premises. On the 2d of August I was asked to see another suspicious case in this village, taken with chill in night and fever characterized by falling pulse with rising temperature: some tenderness in epigastrium; trace of albumen in urine; some jaundice and general prostration. He was convalescent on the 8th.

Upon receipt of your message of the 1st of August I employed two local physicians and commenced a house-to-house inspection in Phoebus, instructing the inspectors to make note of all sick and all unsanitary places found. By application to the local authorities the police force was also made a corps sanitaire. In this way I found there were no further suspicious cases in the town, and it was

pretty thoroughly cleaned up, the citizens vying with each other in this necessary cleaning.

It was also my pleasure to meet with the boards of health of Hampton and Phoebus, conferring with them and Surg. J. H. White, M. H. S., in charge of the quarantine organization and management.

During the house-to-house inspection of Hampton later I was able to give some assistance in seeing all the cases of sickness found in that city and determining the absence of any case of suspicious nature.

Also I at all times visited the Home and gave any advice or assistance possible, Assistant Surgeon Von Ezdorf assuming the direction of all fumigation and disinfection. It was also a pleasure to meet the assembled health boards of Richmond, Norfolk, Newport News, Portsmouth, and the local boards and representatives of our Service, and to assure them of the actual health condition of the communities of Hampton and Phoebus.

Assistant Surgeon Von Ezdorf, acting directly in touch with me, was energetic, efficient, and courteous, giving every satisfaction in the trying position in which he was placed.

Respectfully, yours,

EUGENE WASDIN,
Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

Following are the reports of Surg. J. H. White and the several officers actively engaged in the suppression and prevention of spread of the yellow fever at and near the Soldiers' Home:

REPORT OF SURG. J. H. WHITE.

WASHINGTON, D. C., *November 1, 1899.*

SIR: I have the honor to report that in obedience to instructions received from you over the telephone, on the night of July 30, to proceed to Hampton, Va., and assume charge of the executive and administrative work connected with the suppression of the small epidemic of yellow fever reported to be existent at the National Soldiers' Home, near Hampton, Va., I proceeded on the morning of the 31st to Newport News, that being the farthest point which could be reached by rail, and thence by the best means available to Hampton, Va.

On the morning of August 1, in company with Surgeon Wasdin, I was present at a called meeting of the board of health of Elizabeth City County, which includes the towns of Hampton and Phoebus and the National Soldier's Home, and ascertained from them what measures had already been taken with the end in view of confining the disease to its existing limits and of eradicating it where it already existed.

I found that a cordon had been thrown around the Soldiers' Home and that the town of Phoebus was still in communication with Hampton. Outlying cities, suspecting that Phoebus was not free from fever, had quarantined against Hampton, and inasmuch as Hampton had voluntarily made herself communicating territory, she was, to that extent, justly liable to quarantine. I recommended to the board of health that a cordon should be placed around the town of Phoebus, and such a cordon as would effectually prevent communication between Phoebus and the outside world. This they agreed to, and passed a resolution to that effect. They then passed a further resolution agreeing to turn over the control of all measures for the prevention of the spread of epidemic disease in Elizabeth City County, for the time being, to the Marine-Hospital Service. This responsibility was accepted, and the guard already in the employ of the county were taken up on the pay roll of the Service, and additional guards employed for service outside the town of Phoebus.

Arrangements were made for the disinfection of mail from the Soldiers' Home and from Phoebus, and subsequently from Hampton. On August 5 I submitted the following letter to the Bureau, describing the situation at that time, Passed Assistant Surgeon Wertenbaker and Assistant Surgeon Von Ezdorf having arrived at Hampton and reported for duty in the meantime:

"MARINE-HOSPITAL SERVICE,
"OFFICE OF MEDICAL OFFICER IN COMMAND,
"Hampton, Va., August 5, 1899.

"SIR: I have the honor to report that the situation here to-day is, to the best of my knowledge and belief, as follows:

"The guard around the Soldiers' Home and the outer line surrounding the community known as Phoebus is effective, and the only coming and going through this line is that involved in the transportation of supplies to the people of the inside community by means of wagons, whose crews are relayed at Hampton Bridge. The normal school, which is within the Phoebus district, though not a part of the town of Phoebus, being distant a mile therefrom, has liberally cordoned its own grounds, and in so doing has strengthened the Service cordon to that extent, the school lying partly between Soldiers' Home and Hampton and partly between Phoebus and Hampton.

"Passed Assistant Surgeon Wertenbaker is preparing a chart showing the relative position of the points involved in this quarantine and location of the cordon. The expense of maintenance of these cordons is large, but, I believe, justified. Surgeon Wasdin, Acting Assistant Surgeon Vanderslice, and Acting Assistant Surgeon Reed are engaged in a house-to-house inspection in Phoebus, and arrangements have so far progressed on this side that I expect to begin a similar process in Hampton to-morrow morning.

"I am informed by Assistant Surgeon Von Ezdorf that the outlook for a proper segregation of the old soldiers is improving.

"So far as the control of transportation is in my power this portion of the necessary arrangements has been satisfactorily arranged. But so timid is the outside population that they refuse to admit empty flat cars in the outside communities for the purpose of bringing in freight. I hope, however, to soon be able to adjust this difficulty.

"It is my opinion that after the completion of his present assignment to make arrangements for the inspection of outside territory as to drift, the service of Passed Assistant Surgeon Magruder will be extremely valuable at this point, and I trust that he may be ordered here. There is an infinity of small details to be attended to which are absolutely beyond the capacity of one or even two men, even if both are possessed of inexhaustible patience and ingenuity. Dr. Wertenbaker's time is entirely employed and entirely needed in seeing that the guard lines are what they should be, and consequently everything else falls upon me, and it is for this reason that I ask for Dr. Magruder, in whose judgment and discretion I have entire confidence, and with whom, therefore, I would be willing to share the responsibility of the discretionary work.

"Respectfully, yours,

J. H. WHITE, *Surgeon.*

"The SUPERVISING SURGEON-GENERAL,

"U. S. Marine-Hospital Service."

It will be seen by this letter that the organization of the cordon and of so much of the transportation as was under the control of the Service was by that time thoroughly effected. It was also shown that much difficulty existed in the matter of obtaining supplies from the outside, on account of the timidity of outside populations with regard to transportation vehicles. This timidity, it should be said, is largely due to the fact that only the oldest inhabitants in this part of the country have any personal recollection of yellow fever, and their recollection goes back

to a time when everything was considered unsafe, when no proper idea existed as to the method of spread and propagation of the disease, and consequently it was entirely natural that these people should object to the transportation arrangements proposed and not be able to see the entire safety of these arrangements.

This, however, made the task of the officer in command extremely difficult, because people in quarantine must be supplied with all of the necessities and many of the luxuries of life if it is desired to keep them satisfied.

While this work of organization was in progress in Hampton and Phoebus, and that in the Soldiers' Home, which will be described in the report of Assistant Surgeon Von Ezdorf, submitted herewith, Surgeon Magruder, with the assistance of Acting Assistant Surgeons Donaldson and Farquhar, was making an exhaustive inquiry as to the whereabouts of all persons who had left Hampton and Phoebus before the placing of quarantine. Surgeon Pettus, acting under the authority of Bureau orders and of War Department consent, assumed charge on August 1 of the quarantine measures for Fort. Monroe, and the cordon placed around Fort Monroe under his direction practically doubled on the east side the defensive measures against any spread of the disease from Phoebus. A house-to-house inspection was twice made in both Hampton and Phoebus, the last of these inspections involving a medical inspection and questioning of every person in the population of the two towns, regardless of whether they were sick or well, and every physician in Hampton and Phoebus having been employed as an acting assistant surgeon of the Service in this important work.

One case of yellow fever was found by Surgeon Wasdin in the person of a policeman in the town of Phoebus on August 1, practically convalescent; another on August 2 in the person of Mr. —, a barber. The house of the first case was most thoroughly disinfected, the family being removed in the meanwhile to another house provided by the Service for them. This house was isolated, and consequently the probability of infection to any neighboring houses was scant.

With regard to the residence of the second case, the barber, in the rear of his shop, it was necessary to take more active measures, inasmuch as the adjoining residence was a portion of the same house and used as a tailor shop. Both this house and a laundry in the rear were closed up, and, subsequent to the recovery of the patient, thoroughly disinfected. This last case was discharged, after being furnished new clothing, on August 9.

No foci then remained outside of the Soldiers' Home, and the house-to-house inspection, completed on that date, showed nothing suspicious.

Accordingly I telegraphed the Bureau on August 10 as follows:

"Conference [authorities of Newport News, Norfolk, Hampton, and Virginia State board] wants assurance that Boston, New York, Philadelphia, and Baltimore will not quarantine Norfolk, Portsmouth, Newport News, and Old Point if quarantine on Hampton is raised. I certify that Hampton is not infected and has been most thoroughly inspected, house to house, with no results. Please ascertain status of New York and other cities and wire results to boards of health interested. It is useless exposure and hardship to quarantine Hampton, and prompt action will be appreciated by all."

In response to which the Bureau promptly sent the following telegram to all the cities interested:

"Conference of local health officers requests me to obtain assurance that Boston, New York, Philadelphia, and Baltimore will not quarantine against Norfolk, Portsmouth, Newport News, and Old Point if the quarantine on Hampton, Va., is raised. Surgeon White, Marine-Hospital Service, who has been at Hampton since outbreak, certifies that Hampton is not infected, and has been most thoroughly inspected with house-to-house inspection, with no suspicious cases found. He states that it is useless exposure and hardship to quarantine against Hampton. This village is from 1 to 2 miles from the National Soldiers' Home, where outbreak

occurred. A strong cordon, under Marine-Hospital Service, surrounds the Home and the town of Phoebus, adjoining the Home, on the side farthest from Hampton. Phoebus is also now free from disease, as shown by house-to-house inspection. No new cases or deaths in Home for several days. There is no reason known to me for quarantining against any other places than Phoebus and National Soldiers' Home. I will promptly inform you should any new cases appear. Kindly wire me whether you will give the assurance requested or not.

"WYMAN,
"Surgeon-General."

Favorable responses were received from New York and Baltimore immediately, and later from the other cities.

It may be said in this connection that while in the light of subsequent events it has been proven that the quarantines which had been put in operation against Hampton and Old Point were not necessary, nevertheless they were very effective, and particularly was this the case with regard to the land quarantine established by Newport News. The board of health of Newport News is worthy of all consideration, in view of their prompt and effective putting on of quarantine while they believed a risk to be imminent, and of the readiness with which they accepted the statements of the Service that the disease had been limited to Phoebus, and that the ten days' intrinsic incubative period having passed in the city of Hampton without any developments there was no longer any need for quarantining Hampton. The Service has never met with more friendly or more hearty cooperation than was accorded by these gentlemen.

I desire further to say that it has never been my fortune to meet with a conference of local authorities more reasonable and more inclined to accept suggestions offered in good faith in the same spirit in which they were offered.

The quarantine having been removed from the town of Hampton on August 11, in accordance with the agreement arrived at in conference, the whole of the Service effort could be concentrated on the removal of the last vestige of suspicion from the town of Phoebus and ultimately from the National Soldiers' Home. The cordon around Phoebus was moved on the 12th to a point near the national cemetery, leaving out certain population between Phoebus and Hampton which had been previously quarantined, but who for their own protection had quarantined themselves against Phoebus, and which population was so sparse as to be constantly under observation without difficulty.

This included the Dixie Hospital. The number of guards was increased rather than diminished, amounting to a total of 207, and all were cautioned to use the utmost vigilance to prevent any exit from the National Soldiers' Home, in order that at the earliest possible moment the town of Phoebus might be released from further restrictions. On August 15 another conference was called to meet at the Chamberlain Hotel, with a view to informing the local health authorities of Norfolk, Portsmouth, Newport News, and Hampton of the existing conditions, and of the intention of the Service to remove any further restrictions on Phoebus, it having been ascertained in so far as a most careful investigation could make known, that there was no further infection in that place. On account of stormy weather this conference was not well attended, and I therefore wired the Bureau requesting that the authorities interested should be notified of the recommendation made to the Bureau, that the cordon should be removed from around Phoebus, and a strong cordon maintained around the Soldiers' Home. In response to this telegram the Bureau sent to Dr. Hope, quarantine officer at Portsmouth, Dr. Brice, board of health, Portsmouth, Dr. Newville, the president of the board of health of Norfolk, the following telegram:

"I have approved Surgeon White's recommendation to remove cordon around Phoebus and maintain strong cordon around Soldiers' Home. Phoebus has been

practically a detention camp for two weeks, and pratique to its inhabitants can not now be refused. Dr. White, after repeated and almost continuous inspections, declares it is absolutely not infected, judging by all known means of investigation. Conference this afternoon unanimous in favoring immediate relief for Phoebus."

Up to August 20, no further cases having occurred, and there being no suspicious reports of any character extant, I returned to the Bureau, being relieved by P. A. Surg. A. C. Smith on that day.

Respectfully, yours,

J. H. WHITE,
Surgeon, Marine-Hospital Service.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

LETTER OF SURG. J. H. WHITE, RECOMMENDING PROCEDURE ADVISABLE PRIOR
TO FINAL REMOVAL OF RESTRICTIONS ON SOLDIERS' HOME.

WASHINGTON, D. C., *August 26, 1899.*

SIR: Referring to the present status of affairs at the Soldiers' Home near Hampton, Va., I beg to offer the following suggestions, prefacing them by a statement showing the analogy between the case in hand and that at McHenry, Miss., in 1898.

At McHenry there was in existence something like a score of cases of yellow fever before its presence was discovered; a like state of affairs existed at the Home. Near McHenry, but outside the inner cordon, a further case was discovered before sufficient time had elapsed to allow the infection of the house to become potent for evil, so far as others were concerned; a precisely similar condition was found in the town of Phoebus. To continue the analogy further, the neutral zone and the drift territory were released from quarantine in the case of the McHenry epidemic as soon as it was effectively proven that no more cases existed in the former and that none had existed in the latter. The neutral zone in the case of the Soldiers' Home, to wit, the town of Phoebus, and the drift territory, Hampton and other nearby points, were treated in precisely the same manner as the drift territory in 1898 near McHenry. The actually infected zone was kept secluded from the outside world until after fourteen days subsequent to disinfection, during which time free intercommunication between the inhabitants of McHenry within the lines and the thorough exposure of all nonimmunes therein to all the disinfected points in the town of McHenry, had fully demonstrated the effectiveness of the disinfection done in that town.

In view of these facts, I have the honor to suggest that when the now nearly completed disinfection of the inmates of the Soldiers' Home has been finished, the Home be inspected by an officer competent to decide upon such cases, and if his report shows no existing cases, that thereafter all inmates of the Home should be allowed free intercommunication with one another, with a removal of every restriction except that as to communication with the outside world.

Second, that if at the end of fourteen days another inspection made by similarly competent authority shows the existence of no yellow fever among the inmates of the Home, it will then be beyond question safe to allow exit from the Home on the part of the inmates, the reasons for this being that there are probably upward of 3,000 nonimmunes within the lines who are now and have been for some time, in so far as possible, prevented from having any communication with the infected foci, and it is, in my opinion, entirely justifiable to use these inmates of the Home as controls to test the efficiency of the disinfection done therein before allowing visitors from the outside. This is precisely what was done at McHenry, Miss., and with negative results. Similar results, will, I believe, be attained at the Home; I doubt not that you will concur in the opinion that the inmates of the

Home should themselves be the first to test the efficiency of the disinfection done therein.

Very respectfully, yours,

J. H. WHITE,

Surgeon, Marine-Hospital Service.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF PASSED ASSISTANT SURGEON WERTENBAKER.

WILMINGTON, N. C., *August 21, 1899.*

SIR: In obedience to instructions dated August 16, 1899, directing me to make a written report of my transactions in connection with the recent outbreak of yellow fever at the National Soldiers' Home near Hampton, Va., I have the honor to report as follows:

On the morning of July 31, 1899, I received telegraphic orders from you to report immediately to Surgeon White, United States Marine-Hospital Service, at Soldiers' Home, Hampton, Va., and stating that I would probably be needed for inspection of outlying territory in connection with yellow fever.

I left Wilmington, N. C., by first train and arrived at Newport News about noon the following day. Here I found a great deal of excitement over the outbreak of the fever. Newport News had quarantined against Hampton, Phoebus, Old Point, and the whole lower part of the peninsula. It was with difficulty that I finally secured transportation through the quarantine lines and succeeded in reporting to Surgeon White at Hampton late in the afternoon of August 1, 1899, being the first officer who had reported.

Surgeon White was overwhelmed with work and needed assistance badly. I was at once assigned to the charge of the guards. I found, however, that the guard had been so efficiently organized by Surgeon White that there was but little for me to do in that connection beyond attending to the minor details.

There were two lines of guards, one around the Soldiers' Home proper, and a second line that surrounded the town of Phoebus, a portion of East Hampton, and the Home. The inner line was made up of guards taken entirely from within the outer line, in order that there should be no communication between the quarantined territory and the outside world.

The inner line consisted of 24 men and 2 chiefs, 14 guards and a chief being on duty at night and 10 guards and a chief being on duty during the day. The outer line consisted of about 60 men, the number varying slightly from day to day. Of this number usually 35 were on night duty and 25 on day duty. The location of the Soldiers' Home in relation to the surrounding territory made the establishment of an effective cordon very difficult. The grounds of the Home front for several hundred yards on Hampton River, an estuary from Hampton Roads, and lie between two small creeks that can easily be waded at low tide. Thus it was necessary to establish a water guard to prevent escapes by boat, as well as a land guard. On the land side there was a large field of corn, and it required great vigilance to prevent escapes from the Home into this field. It must be remembered that in the Home were between 3,000 and 4,000 old soldiers, many of whom could not be convinced that yellow fever existed in the Home, and who bitterly resented being quarantined; hence the need for the greatest vigilance on the part of the guards. One inmate made a break through the lines and got into the corn, but was soon captured and returned to the Home. This was the only case of the line being violated.

The outer guard line consisted of two parts, the land and the water line. The land guard extended from the railroad bridge over Hampton River, along the line of the Chesapeake and Ohio Railroad, that skirts the towns of East Hampton and Phoebus, to the bridge over Mill Creek, that separates Old Point from Phoebus.

The water line extended from the Mill Creek bridge to the railroad bridge, thus completely encircling the Home and all suspected territory. At night the guard line was lighted by numerous lanterns and the water line was carefully patrolled by guards in three launches and numerous small boats.

The normal and industrial school, which was included within the outer cordon, rendered us great assistance by maintaining a most efficient guard of their own around the school, and incidentally strengthening our line on the side of the Home. The school has a battalion under military discipline, and maintained their guard in military fashion.

When the guard was first organized each relief stood a twelve-hour tour of duty and was in charge of a chief or an assistant chief, each chief sending a written report to me each morning at 9. When the quarantine around Phoebus and East Hampton was raised, the guard was reorganized into three companies of 25 men each. Each company was in charge of a captain, who reported to a chief who had supervision over all the companies, and who reported to me. Each company had an eight-hour tour of duty, instead of twelve hours as previously, and had a corporal who watched one end of the line while the captain was inspecting the other end. Both the captain and corporal remained on the line with the men throughout the entire tour of duty.

Acting Asst. Surg. H. D. Howe was assigned to duty as my assistant with the guard, and rendered most efficient service. I also wish to express my acknowledgment of the efficient services of Chiefs Jones and Sclater of the outer line, and Chiefs Williams and Webber of the inner line. The efficiency of the guards was largely due to their efforts.

In addition to my duties with the guard, I also acted as assistant to Surgeon White and performed such miscellaneous duties as directed. My chief work consisted in superintending transportation matters. In order to get mail and supplies through to Phoebus and Old Point a special trolley car was run several times each day from the Newport News quarantine line to Old Point and return. As this car had to pass through the quarantined territory, it was thought best that it should always be accompanied by a commissioned officer, and I was detailed for the work. It was also necessary to carry many supplies of all kinds to the Home, and in all such cases I accompanied them for the purpose of preventing any communication with the Home.

The methods employed were as follows: The trolley car, with flats as trailers, would run to the bridge that connected the Home with Phoebus, and outside the guard line. Here the supplies would be unloaded by the guard and motormen. When the cars had left, the guard line would be thrown back some 50 yards, so as to include the supplies within the line. Wagons would now be allowed to come out from the Home, cross the bridge, and remove the supplies to the Home. After the wagons had gone the line was again drawn up to the bridge.

Two days before the quarantine around Phoebus was raised, the train inspector, who had been put on passenger trains to Old Point by the State board of health and had been running with them ever since the trains were allowed to pass, was removed, and I was detailed for this duty. I made the run from Old Point to Hampton and returned twice daily through the quarantined district until the quarantine was raised, when there was no further necessity for an inspector. On August 16, 1899, I received orders to rejoin my station and left the same day. All of my work in this connection was in a subordinate capacity, under the direction of Surgeon White, and to him is due all the credit for the brilliant work that he did in so quickly suppressing this dangerous outbreak.

Respectfully submitted,

C. P. WERTENBAKER,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

(Through Surg. J. H. White.)

REPORT OF PASSED ASSISTANT SURGEON STIMPSON.

St. Louis, Mo., *August 25, 1899.*

SIR: I have the honor to forward the following report of the transactions under my direction in connection with the outbreak of yellow fever at the National Soldiers' Home near Hampton, Va.

When I arrived in Hampton I was directed by Surg. J. H. White to visit the post-office and instruct the postmaster, Mr. E. G. Darden, in regard to the disinfection of the mails. Mr. Darden had been directed by the Post-Office Department to disinfect all outgoing mail, and had been authorized to incur any expense necessary. A large formaldehyde generator and a stone jar of formalin solution had been sent to the post-office from the quarantine steamer *Jamestown*, and Mr. Darden had begun the construction of a wooden chamber having a capacity of 350 cubic feet. This chamber was finished in a few hours, lined with building paper, and fitted with wire racks for holding the letters. The door was made tight by means of rubber strips. The letters were perforated by nails fixed into a wooden handle and the newspapers and packages opened before being placed in the chamber. The gas was introduced through a small hole in the door. The letters were left in the chamber at least two hours and the newspapers and packages four or six hours. The mail from the Soldiers' Home was disinfected before leaving that institution. The Pheobus mail was sent to the Soldiers' Home and the Old Point mail to Hampton for disinfection.

The Chesapeake and Ohio Railroad Company requested Dr. White to have a number of empty cars in their yards in Hampton disinfected, so that they could leave Hampton. Dr. White directed me to take 2 men and a force pump and wash out these cars with an acid bichloride solution 1:2000. The cars were swept out and thoroughly drenched with the solution, after which they were locked and sealed. Twenty-five cars were thus treated. A "disinfected" label was attached to each car.

When Mr. Mastin, of Phoebus, recovered from his attack of yellow fever, Dr. White directed Dr. Fondé, of Mobile, and myself to disinfect his house with sulphur dioxide. Mr. Mastin and his family were given clean clothes and moved to an adjoining house. All closets, bureaus, and other closed places were opened, and their contents hung upon bedsteads, chairs, etc. The windows and doors were sealed with paper. A large quantity of sulphur—7 pounds per 1,000 cubic feet—was then burned in the house, and the house was not opened for seventy-two hours. The preparation for this disinfection was done under the direction of Dr. Fondé, who is an immune. As I am not an immune I was not permitted to enter the building. The barber shop of Mr. Spraggins and the adjoining tailor shop of Mr. Ludwig were, upon the recovery of Mr. Spraggins from yellow fever, treated in the same manner. Mr. Spraggins's bedding was burned and all underclothing not destroyed was soaked in a strong bichloride solution. His shop, a few days later, was also disinfected by formaldehyde gas, 6 per cent volume, twenty-four hours exposure.

Respectfully, yours,

WM. G. STIMPSON,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

(Through Surg. J. H. White.)

REPORT OF ASSISTANT SURGEON VON EZDORF ON METHODS ADOPTED WITHIN THE HOME, INCLUDING DISINFECTION.

NATIONAL SOLDIERS' HOME,

Hampton, Va., September 4, 1899.

SIR: I have the honor to submit the following report of transactions under my direction and work done in giving assistance to Major and Surgeon Vickery,

U.S.A., in connection with the outbreak of yellow fever in the National Soldiers' Home at Hampton, Va.

I arrived at the Home on the night of the 2d of August, 1899, reporting to Surgeon and Major Vickery, U.S.A. On the following morning I made an inspection of all the barracks in which cases of yellow fever had occurred. There were in all fourteen buildings infected, namely, the hospital, two hospital annex buildings, the pavilion, and ten barracks. Besides these known infected buildings, I placed suspicion upon nine buildings, namely, the post-office and library buildings, in which rooms were occupied by men from infected companies, the morgue, pest house, nurses' cottage, and four convalescent company barracks. Four barracks were free from infection or suspicion.

Orders had already been issued regarding the detection of any suspicious cases, the airing and sunning of mattresses and bedding. All yellow fever cases, as well as suspicious cases, had been isolated. Mattresses and all bedding of those known to be sick with yellow fever were taken from the barracks and stored in the pest-house and later burned. The mingling of the men with one another was inevitable, as there was a common mess room seating 1,200 men at one time. Since this occurred at daytime it was not probable that infection would be spread in this way. In the four non-suspicious barracks I had the captains instructed to inform their men under no circumstances to enter the infected barracks. The early depopulation of the infected barracks prevented further danger to such exposure.

DEPOPULATION.

Efforts were first made to depopulate the infected quarters. Tents were erected, new mattresses, blankets, and other bedding supplied them, iron bedsteads, previously cleaned by washing, aired, and sunned, were taken in the tents from barracks vacated by the men. Orders were issued that absolutely nothing be taken to the tents from any of the quarters.

On August 4, 157 men were occupying tents; August 5, 456 men were occupying tents; August 6, 707 men were occupying tents; August 7, 1,296 men were occupying tents; August 12, 1,500 men were occupying tents; August 20, Company M went into tents, and on August 31, all men with disinfected clothing were out of the hospital.

DETECTION OF SUSPICIOUS CASES.

Sick call was made each morning at 8.30 a.m., and attended by one of the physicians of the Home staff. The physician in charge of this department was continually on the alert to detect any suspicious cases. A suspicious case was admitted to the receiving ward, later a suspect tent was erected, and if further observation proved him to be a case of yellow fever, he was removed to the isolation ward. One such case was admitted to the suspect tent, which proved not to be yellow fever. The isolation ward was located in one wing of the hospital, on the lower floor, and was well adapted for the purpose.

The captain of each company was instructed to inspect his men, report any sick, and require such sick to attend the morning sick call. Orderlies in charge of rooms, under supervision of the captains, were similarly instructed.

I was shown five cases in the hospital wards during the first few days I was here, and did not deem any of them sufficiently suspicious to require isolation. Further observation proved none of the cases to be in the least suspicious.

DISINFECTION.

The work of disinfecting the buildings was begun as soon as the first barracks were vacated. Sixteen men, all soldiers of the civil war, immunes, were employed to do the work. Three experienced immune disinfectors soon arrived. Attendant

Lindgren was made foreman, and the other two as subforemen at the head of a crew of eight men. Each crew was again divided, composed of a subforeman and three men. It was found advantageous to have a small crew working together as they could more easily be directed for any special work. Orders were issued to each company vacating barracks to leave their lockers, luggage, or any boxes open, but not to handle any clothing in such containers. This was in most cases done, and where keys were not obtainable such containers were forcibly opened.

The preparation of the rooms for disinfection was the same as is ordinarily done.

All cracks about windows, in walls, floors, where large, and doors, ventilators, and about pipes were pasted up with strips cut from newspapers, and the room rendered as near airtight as possible. Ropes were stretched, all clothing and blankets loosely hung up and distributed about chairs and hooks. Where mattresses were not burned, these were loosely rolled and stood on edge; all containers were left open.

All bed linen was disinfected by immersing same in solution of bichloride of mercury 1:500.

Sulphur was used for fumigation, employing 7 pounds to the 1,000 cubic feet, the excess being for leakage. Exposure was seventy-two hours.

Formaldehyde fumigation at 4 per cent was used in some instances, exposure being for twenty-four hours.

On completion of fumigation all floors and walls where rough were washed with a solution of bichloride of mercury 1:500 applied with a force pump. The elevator shaft and engine room, and in some buildings the rooms underground, where well ventilated, were freshly whitewashed.

THE HOSPITAL.

The work of disinfection of the hospital was the same as in the other buildings, save that all mattresses and pillows were burned, and that all patients leaving the hospital for tents or the hospital annex buildings wore disinfected clothing. I also disinfected all clothing, with baggage, as well as all clothing worn by any patients discharged from the hospital during the month before they rejoined their respective companies.

All mattresses, pillows, and bedding in the pavilion were burned.

Disinfection of mail was begun on August 3. Mail leaving at 4 p. m. was disinfected in nearly saturated atmosphere of formaldehyde at 10 a. m., six hours exposure. Mail disinfected at 4 p. m. left the following morning, seventeen hours exposure. All mail was punctured for fumigation. Only letters, no packages, were disinfected, no packages being sent out.

MEN RETURNING TO CLEAN BARRACKS.

After the men had been in tents seven and ten days or more, they were allowed to return to their quarters. Every man returning to the barracks was inspected, pulse counted, and a general history taken. Their iron bedsteads were disinfected with 1:500 solution of bichloride of mercury before returning same to their quarters. When any baggage or fabrics were slipped out of the quarters, such was subjected to disinfection before returning it to the quarters.

I found eighteen men from all companies giving histories of an illness of a suspicious nature, occurring in July. Such cases I required to take a full bath put on disinfected clothing, and disinfected the clothing worn.

On September 3 I made an inspection of all the hospital patients, a general medical inspection being made of all the inmates of the Home by the house physicians. The result of this examination showed no suspicious cases, and the general health of the camp excellent. Work of disinfection was practically completed Septem-

ber 2. I also submit a list of the buildings fumigated and disinfected, the cubic feet air space of each, and date of their disinfection.

A plan of the National Soldiers' Home is also submitted to show approximately the location of these buildings. It will be seen that the infected buildings were bunched to the west of the reservation, and all these were depopulated by August 7.

Buildings disinfected.	Air space.	Date begun.
	<i>Cubic feet.</i>	
Company H	25,000	Aug. 8.
Company F	34,000	Aug. 8, 11.
Company G	25,000	Aug. 8.
Company G and quartermaster's department	116,000	Aug. 8, 10.
Company F	53,000	Aug. 11.
Company H (colored)	31,000	Do.
Barber shop, in main building, formaldehyded	8,000	Aug. 13.
Company I	182,000	Aug. 15.
Companies A, B, C, D (main building)	468,000	Aug. 17.
Room over post-office	14,000	Do.
Company H	170,000	Aug. 18.
Convalescent building (colored)	62,500	Do.
Convalescent building, I	29,000	Aug. 19.
Convalescent building, III	35,000	Do.
Convalescent building, II	35,000	Aug. 21.
Room under library	1,000	Aug. 22.
Company M	190,000	Aug. 23.
Hospital annex, I	148,000	Aug. 25.
Hospital annex, II	148,000	Do.
Hospital	700,000	(Aug. 1) Sept. 1.
Quarters of workmen	18,000	Aug. 26.
Pavilion (bichlorided)	55,000	Sept. 2.
Morgue	3,800	Do.
Nurses' Home (formaldehyded)	36,000	Do.
Pest house	1,200	Do.
Total	2,588,500	

Library, post-office, telegraph office, printing office, and dispensary bichlorided August 22.
Beer hall bichlorided August 27, 1899.

I wish to say that, with few exceptions, the men were very patient with all their inconveniences while undergoing detention in tents.

I desire to express my appreciation of the kindness and aid given me by all the officials of the Home in the performance of my duties while there.

Respectfully, yours,

R. H. VON EZDORF,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.
(Through Surg. J. H. White.)

[Inclosure No. 1.]

List of cases and deaths.

No.	Date.	Name.	Com- pany.	Remarks.
1	.....	Jacob Stein	F	Died July 28.
2	.....	John J. Kelly	A	Died July 27.
3	July 16	Abraham Barker	A	
4	July 23	Christopher Hickey	H	
5	do	George Muller	K	
6	July 24	Charles McGovern	I	Died Aug. 4.
7	do	Wm. H. Beale	A	Died July 30.
8	July 25	F. L. Wood	A	
9	do	John Vickers	A	
10	do	Wm. B. Smith	A	P. W. Aug. 2; discharged Aug. 23.
11	July 26	David McGallen	D	Died July 23.

List of cases and deaths—Continued.

No.	Date.	Name.	Com- pany.	Remarks.
12	July 26	Wm. Wunder.....	B	P. W. Aug. 2; discharged Aug. 23.
13	do	Wm. Burke.....	F	Died July 30
14	do	Philip Taggart.....	H	P. W. Aug. 2; discharged Aug. 23.
15	July 27	B. C. Beebe.....	K	
16	do	Daniel O'Connell.....	D	
17	do	H. F. Sanford.....	D	Died Aug. 4.
18	do	J. F. Fryer.....	G	P. W. Aug. 2; discharged Aug. 23.
19	do	John Smith.....	B	Died July 30.
20	July 28	Charles Garden.....	F	P. W. Aug. 2; discharged Aug. 33.
21	do	Alfred Kane.....	H	Died July 31; discharged Aug. 23.
22	do	H. S. Whitfield.....	A	
23	do	Wm. Mitchell.....	K	P. W. Aug. 2.
24	do	Charles Herwick.....	A	Do.
25	July 29	Wm. Darley.....	F	Died July 30.
26	do	Geo. W. Richardson.....	F	
27	do	Nathan Whitley.....	G	
28	do	Julius Sucker.....	G	Died Aug. 4.
29	do	Samuel Heart.....	G	
30	do	Thos. Birmingham.....	F	
31	do	Henry Reis.....	M	
32	do	Closkey Bernard.....	D	
33	do	John Waugh.....	G	
34	do	Fred Bishoff.....	G	
35	do	Henry Kennig.....	G	
36	do	Peter Jones.....	G	
37	do	Geo. Garrabraut.....	D	P. W. Aug. 2; discharged Aug. 23.
38	do	Daniel Boyle.....	D	Do.
39	July 30	J. N. Brooks.....	H	
40	Aug. 1	Thos. J. Woods.....	F	
41	do	F. C. Noirel.....	I	
42	Aug. 2	Joseph Ates.....	H	
43	Aug. 7	Fred S. Foster.....	K	
44	do	Christofe Friedinger.....		Died July 28 (?).

[Inclosure No. 2.]

Daily journal of events.

August 3.—Tents arrived, some erected; made inspection of all barracks; disinfected the mail; one autoclave received; made sick call in yellow-fever ward; three cases very sick; no new cases, no deaths.

August 4.—Tents erected; 157 beds provided with new mattresses and blankets; mail disinfected; made two post-mortems, typical; three deaths, no new cases; met Drs. White, Wasdin, and Wertenbaker at Hampton Bridge; inspected the camp; recommended new mattresses and blankets for use in tents; Dr. Vickery had intended putting old mattresses into tents, to which I objected, and informed him that I could not vouch for results. My proposition was therefore accepted; suspect tent proposed.

August 5.—Rules submitted to Major Vickery.

1. No men to return to any living quarters after entering tent.
2. Take absolutely nothing to the tents.
3. Have daily muster; count men; hand in daily report of total number of men in company living in tents from each company; total answering to sick call; inspect at all hours daily for any sick.
4. Sun and air blankets and mattresses daily.
5. Report any new arrivals to company, particularly if from hospital.
6. Take the following precautions: Retire early; avoid chilling of body; avoid night air; avoid getting fatigued; see that bowels move daily; must not sleep on ground; avoid intemperance; wear wet handkerchief or tree leaves in hat when much exposed to sun.
7. Should anyone develop yellow fever, mattress and pillow should be burned. Bedding should be disinfected in solution bichloride of mercury 1:800.

8. Any men discharged from hospital must have their clothes disinfected before rejoining their company.

9. Men returning to their disinfected quarters must remain in them and follow rules as above; i. e., rules 3 to 7, inclusive.

Mail disinfected: new mattresses arriving this p. m.; provisions arriving; 456 beds in tents occupied to-night; no new cases, no deaths; inspected the quarters vacated and found that all mattresses, blankets, wearing apparel, etc., were left; on inspection of tents I found eight satchels taken from the quarters (these were returned); the entire Company A is in tents; men of companies F, G, and H are occupying tents; total occupants for the night, 456; again advised the immediate burning of mattresses on which patients were taken with the fever and all those on which patients died; informed that these mattresses were put away in pest house: 1 barrel of sulphur received at 8 p. m.

August 6.—Seven hundred and seven men in tents; barracks Company G begun; have 11 disinfectors, immunes: Mr. Lindgren arrived 1 p. m. for duty; 4 barrels of sulphur, 12 pots, 1,500 new mattresses, and 100 tents received.

August 7.—Two mails disinfected; quarters of companies G, H, and F were prepared for disinfection and sulphur lit at 7 p. m.: received 36 sulphur pots, 25 barrels of sulphur, 3,000 feet of rope, 50 wash basins, and 50 whitewash brushes; began work in main building; six buildings vacated; Company I building has 10 men still in quarters.

Men in tents:

Company F	134	Company I	200
Company H	38	Company C	125
Company B	120	Company A	192
Company K	192		
Company D	119	Total	1,296
Company G	178		

Mr. Lindgren went to Phoebus to disinfect one house. All linen from beds dipped in bichloride mercury 1:500 before going to the laundry.

August 8.—Two mails disinfected; the hall, baggage rooms, and closet in buildings of Companies G and F disinfected (sulphur); began 2 p. m.; work going on in main building; work of fumigation started in barracks of Company H, Company F, Company G, and quartermaster's department.

August 9.—Twenty-five dish pans received; main building about finished; quartermaster's rooms fumigated; Disinfectors Hope and Massey arrived this day, 5 p. m.

Men in tents:

Company A (33 tents)	191	Company I (52 tents)	203
Company B (21 tents)	118	Company K (42 tents)	192
Company C (21 tents)	122	Company M (1 tent)	2
Company D (20 tents)	118	N. C. S. (1 tent)	4
Company F (46 tents)	132		
Company G (28 tents)	167	Total (287 tents)	1,343
Company H (22 tents)	94		

Not in tents:

Company E	209	Convalescents	324
Company L	150	Hospital	550
Company M	209		
Company N	211	Total	1,653

Present:

Company A.....	203	Convalescents.....	324
Company B.....	137	Hospital.....	516
Company C.....	133	Officers.....	6
Company D.....	128	N. C. S.....	6
Company E.....	209		
Company F.....	143	Total soldiers.....	3,239
Company G.....	180	Employees, civilian.....	75
Company H.....	243	Temporary appointees.....	45
Company I.....	236		3,359
Company K.....	205	Quarantined outside.....	70
Company L.....	150		
Company M.....	209	Total.....	3,289
Company N.....	211		

August 10.—Four carboys of formalin received; work progressing in main building; sheets and pillowcases bichlorided; sulphur pots relit in quartermaster's building; work begun in Company F building; 2 mails disinfected; music rooms in main building disinfected with formaldehyde; 312 tents erected; 1,412 men in tents.

August 11.—Fumigation started at 12 o'clock noon in Company F barracks; fumigation started in Company H (colored) barracks 3 p. m.; work begun in Company I barracks; 2 mails disinfected; received 3 hammers and 2,000 yards of rope.

August 12.—Two mails disinfected; work in Company I building nearly completed; roundhouse and closets bichlorided; 4-foot force pumps received.

Men in tents:

Company A (25 tents).....	191	Company H (39 tents).....	176
Company B (21 tents).....	118	Company I (54 tents).....	203
Company C (21 tents).....	122	Company K (44 tents).....	194
Company D (20 tents).....	118	Convalescents (38 tents).....	79
Company F (45 tents).....	132		
Company G (29 tents).....	167	Total (346 tents).....	1,500

August 13.—Work going on in buildings of Companies I and K; barber shop, formaldehyde fumigation.

August 14.—Work going on in buildings of Company I and Company K; bichloriding of Companies G, H, and F buildings.

Men in tents:

Company A (33 tents).....	193	Company H (39 tents).....	193
Company B (21 tents).....	118	Company I (50 tents).....	203
Company C (21 tents).....	122	Company K (44 tents).....	193
Company D (20 tents).....	117	Convalescents (39 tents).....	79
Company F (45 tents).....	132		
Company G (29 tents).....	167	Total (341 tents).....	1,519

August 15.—Sulphur lit in Company I building; 200 pots received; pumps received; received autoclaves and formalin.

August 16.—One hundred and ninety sulphur pots lighted in main building; work finished in Company K with exception of putting in sulphur pots; work begun at post-office, Companies G, H, and L in quarters.

Men in tents:

Company A (33 tents).....	193	Company H (33 tents).....	141
Company B (21 tents).....	118	Company I (50 tents).....	203
Company C (21 tents).....	122	Company K (44 tents).....	194
Company D (20 tents).....	117	Convalescents (39 tents).....	79
Company F (44 tents).....	98		
Company G (29 tents).....	52	Total (341 tents).....	1,317

Company F, 1 tent vacant; Company H, 6 tents vacant.

August 17.—One hundred and ninety pots started in Companies A, B, C, D, main building; work done in convalescent (colored) barracks; room over post-office prepared and sulphur lighted; raining.

August 18.—Raining; Company I barracks opened; Company K barracks, 1,480 pounds of sulphur lighted, 170,000 cubic feet; convalescent barracks (colored), sulphur started.

August 19.—One hundred and ninety-two men went back into quarters, Companies F and H (colored); 2 suspicious cases, sick three weeks ago, held for disinfection of clothing before returning to barracks; 1 colored man also retained; Company I barracks bichlorided; 2 convalescent wards had sulphur started.

August 20.—Relighted sulphur in main building; opened Company I; examined men of Company I, found one suspect and one sick—not suspicious: opened room over post-office; working in convalescent barracks.

August 21.—Company M vacates building; work begun Company M building; convalescent barracks had sulphur lighted; mail bags disinfected; clothing of convalescent patients disinfected; examined men in Company H in quarters over post-office; some articles of clothing held up for disinfection.

Men in tents:

Company A (33 tents).....	192	Company I (9 tents).....	64
Company B (21 tents).....	118	Company K (44 tents).....	194
Company C (21 tents).....	122	Company M (67 tents).....	203
Company D (20 tents).....	119	Convalescents (59 tents).....	127
Company F (10 tents).....	16		
Company G (9 tents).....	64	Total (316 tents).....	1,287
Company H (23 tents).....	83		

August 22.—Work continues in Company M; bichlorided post-office, telegraph office, newspaper office, printing room, and library; lighted sulphur in one sleeping room for 9 men under library; disinfected dispensary; opened up main building and smokehouse; disinfected clothing of 7 convalescents discharged; yellow fever convalescents had bath and bichloride baths before putting on disinfected clothing.

August 23.—Main building bichlorided; Company M barracks sulphur lighted; Company K men examined and returned to barracks; Company H (colored) examined and returned to barracks.

August 24.—Companies A, B, C, and D were examined; opened up convalescent barracks III, bichlorided; bedsteads of Companies C and D bichlorided; hospital annex vacated.

Men in tents:

Company A (33 tents).....	192	Company I (9 tents).....	64
Company B (21 tents).....	121	Company K (3 tents).....	8
Company C (21 tents).....	122	Company M (67 tents).....	203
Company D (21 tents).....	120	Convalescents (59 tents).....	203
Company F (10 tents).....	13		
Company G (9 tents).....	8	Total (256 tents).....	1,001
Company H (3 tents).....	6		

August 25.—Work begun in hospital annex; sulphur lighted in annex; Companies A and B return to quarters; baggage was brought back to disinfected quarters, some had been taken to clean quarters and then put back to disinfected quarters. Such baggage turned in and disinfected in accordance with orders. Governor informed and orders issued.

Men in tents:

Company B (7 tents)	36	Company K (2 tents)	7
Company C (1 tent)	1	Company M (68 tents)	204
Company F (9 tents)	13	Convalescents (59 tents)	127
Company G (5 tents)	27		
Company H (3 tents)	6	Total (163 tents)	485
Company I (9 tents)	64		

Hospital annex I, disinfection begun; hospital annex II, disinfection begun.

August 26.—Alleyway prepared and sulphur lit at 3 p. m.; some men, Company I, examined and passed; room prepared for disinfection of clothing of hospital patients; Company M building opened; 200 men of annex buildings in tents; fumigation begun in quarters of workingmen.

August 27.—Sunday. Clothes of men in hospital going out into tents; disinfection begun—formal—wards 5 and 7; Company M barracks prepared for bichloriding; beer hall bichlorided; room under library opened.

Men in tents:

Company A (1 tent)	2	Company K (2 tents)	7
Company B (3 tents)	7	Company M (68 tents)	204
Company C (1 tent)	1	Convalescents (49 tents)	57
Company F (9 tents)	13	Annex and employees (34 tents)	200
Company G (5 tents)	28		
Company H (3 tents)	6	Total (150 tents)	589
Company I (9 tents)	64		

August 28.—Bichlorided Company M barracks; two wards of hospital vacated; mattresses, blankets, etc., burned; clothing of wards 2 and 6 fumigated; a great number of valises of Company M and clothing removed from barracks disinfected.

August 29.—Baggage of 48 men of Company M disinfected; also about equivalent of ten pieces again taken from men for disinfection; two wards—2 and 6—of hospital vacated; clothes of men in wards 4 to 8 disinfected; bichlorided annex buildings; passed men of Company M—one man required to take a bath and have his clothing disinfected.

August 30.—Preparations continue in hospital wards 8 and 3; ward 1 not vacated; disinfection of clothes continues.

August 31.—Whole hospital vacated.

September 1.—Sulphur lighted in hospital, 700,000 cubic feet air space; all yellow-fever patients discharged.

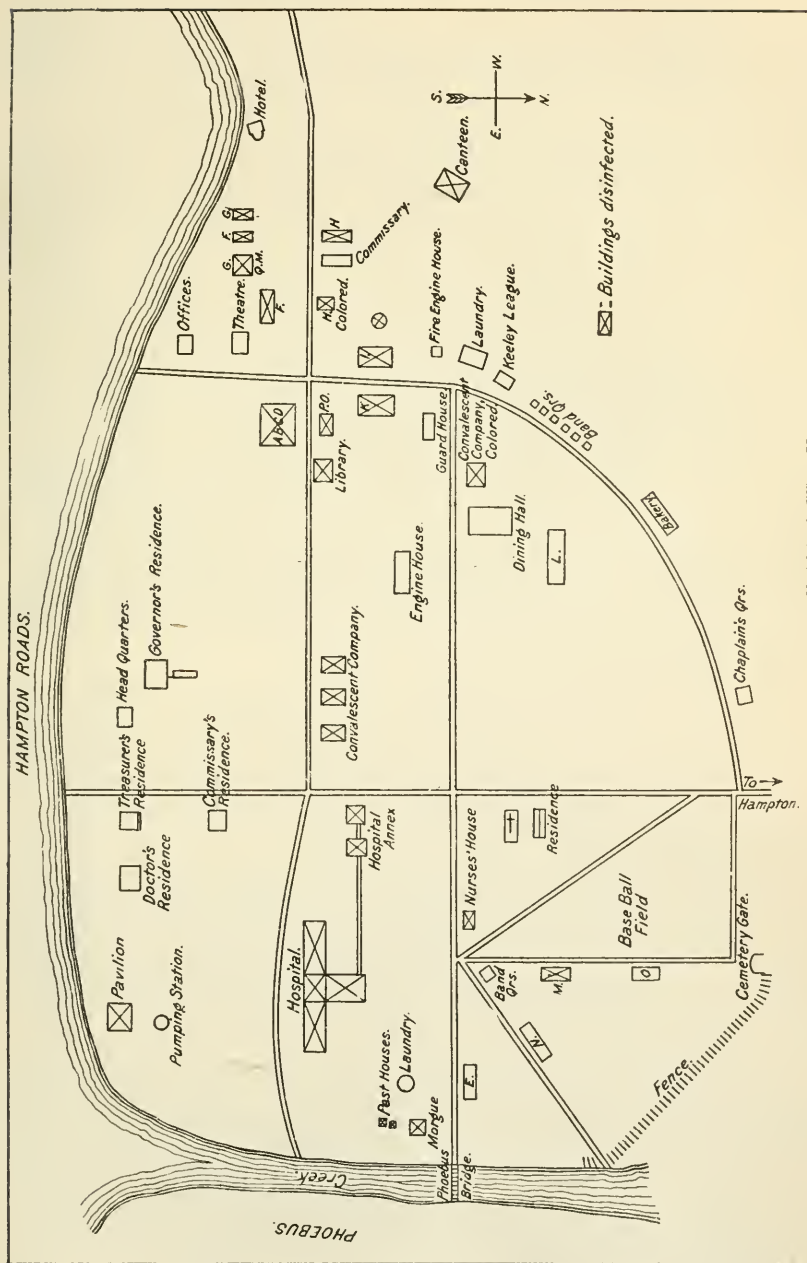
September 2.—Morgue disinfected; pest house disinfected; pavilion disinfected; nurses' home disinfected—formaldehyded; sulphur relit in ward 1.

September 3.—Opened up hospital; 400 men in tents.

September 4.—Bichloriding hospital.

[Inclosure No. 3.]

Diagram of National Soldiers' Home.



REPORT OF SURGEON W. J. PETTUS, IN CHARGE OF SERVICE AT FORT MONROE, VA.

OFFICE OF MEDICAL OFFICER IN COMMAND,
CAPE CHARLES QUARANTINE,
Fort Monroe, Va., August 29, 1899.

SIR: As directed in Bureau letter of August 16, I have the honor to submit the following report of all transactions under my direction in connection with the outbreak of yellow fever in the National Soldiers' Home at Hampton, Va.

On July 28 I received a note from Surgeon Vickery of the Soldiers' Home, asking me to come to the hospital and see some interesting cases with him. As there was no mention of anything suspicious about the cases, a reply was sent saying the invitation would be accepted in a few days. The next day about noon a telegram was received from the Home saying, "Come at once, as the matter is important." I at once proceeded to the Home and saw the cases, 27 in number, that were isolated in one of the large wards of the hospital. While examining the patients with Surgeon Vickery, he informed me that he had just wired the Surgeon-General to send an expert, as he had concluded that I was absent from Fort Monroe, since I had not come the day before. After we had finished examining the patients and made a tentative diagnosis of yellow fever, a telegram from the Surgeon-General came, saying Surgeon Wasdin had been ordered to visit the Home. Upon the receipt of this telegram I informed Surgeon Vickery that I would not report the matter to the Surgeon-General, since a medical officer had been ordered there for that purpose. Surgeon Vickery sent for me upon the arrival of Surgeon Wasdin, about an hour after I had left. I at once returned, but Dr. Wasdin had just left, leaving a note for me to see the cases with him the next morning—Sunday. The next morning, July 30, Dr. Wasdin and I saw the cases with Dr. Vickery; then an autopsy was held on the two patients who had died during the night, confirming the suspicion that the disease was yellow fever. The autopsies were very skillfully done by Dr. Johnson, of the Soldiers' Home staff.

Upon returning to Fort Monroe, Va., I reported the prevalence of yellow fever at the Home to Surg. Calvin DeWitt, U. S. A., and together we called on the commandant, Colonel Guenther, and advised him to institute strict quarantine against the infected locality. Until August 1, Dr. DeWitt and I jointly managed the quarantine; after that date the entire charge of the quarantine matter was turned over to me by the commandant. In rendering the patrol effective, much was due to the cheerful assistance rendered by Colonel Guenther, Dr. DeWitt, and the quartermaster, Captain Townsley.

On August 2 the commandant's steam launch was placed under my orders and two engineers were furnished by Major Casy, of the Engineer Corps, and one by the commandant for continuous patrol duty on the water front. This steam launch was most efficient in maintaining a strict quarantine by water, both day and night. As many soldiers as could be spared were put on guard duty from the start to prevent any one leaving or entering Fort Monroe from Hampton, Phœbus, and the Soldiers' Home.

As there were several hundred guests in the Chamberlin and Hygeia hotels, some arrangements were necessary to get them away. The Chesapeake and Ohio Railroad ran two trains through to Richmond, taking them all away—one on August 1 and another on the 2d. I personally saw all of these people, and, after assuring myself that they had not been exposed to contagion, gave them health certificates, allowing them to go to Richmond or points North. Twenty guards were employed and kept on shore patrol duty to prevent anyone entering the reservation by land or water.

On August 5 Admiral Farquahar sent over a steam launch from the Norfolk Navy-Yard with a detail of 10 men to report to me for patrol duty. They were at

once assigned a part of the water front, and continued to do efficient work until the quarantine was raised. On August 5 all the troops stationed here except 38 men, left by transport *McClellan* for Plum Island, New York. Two officers, Captain Townsley and Lieutenant Gallup, were left, and both of them were of great assistance in keeping up the patrol, having assumed charge of all the guards at my request. Surgeon DeWitt and Acting Asst. Surg. Seaton Norman kept a strict watch for any cases of suspicious sickness that might occur, but nothing was found during the quarantine period.

Owing to the strict quarantine maintained by all the neighboring towns against Fort Monroe, Va., great trouble was experienced in getting supplies sufficient to feed those left at Old Point. After a consultation with Mr. Riddell, agent of the Old Dominion Steamship Company at Old Point, who agreed to take charge of the transportation of supplies for me, to see that all the quarantine regulations were observed, I sent the following telegram to P. A. Surg. A. C. Smith at Norfolk, Va., on August 3:

"Please use utmost endeavors to secure consent of Norfolk quarantine officers to allow boat to bring supplies over here: badly needed. Arrange with some steamer to bring them over; answer. Try Old Dominion Company."

Afterwards the steamer *Hatteras*, of the Old Dominion Company, regularly carried supplies from a barge anchored near Boush's Bluff to Old Point and Hampton. The revenue cutter *Windom* came down from Norfolk on the 5th with General McMahon and Colonel Smith on board, with offer of any assistance needed. No additional water patrol was needed since the two steam launches had proved amply sufficient for the duty.

As soon as the quarantine against Hampton was raised all the guards employed on shore were discharged, but the launch patrol was continued until Phoebe was also freed from quarantine. On August 2 Acting Asst. Surg. A. W. Smith reported for duty. Hospital Steward Peck arrived the same day.

W. J. PETTUS,
Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF ACTING ASSISTANT SURGEON FARQUHAR.

PORTSMOUTH, VA., August 19, 1899.

SIR: On the 31st of July, 1899, I received a telegram from you, informing me of my appointment as acting assistant surgeon in the Marine-Hospital Service for duty in Portsmouth and Berkley. This I acknowledged immediately by telegraph and at the same time asked for explicit instructions as regard my duties.

In accordance with orders received, I placed myself in touch with the health and other authorities by calling upon Dr. Morgan, health officer of Berkley, also the head of the police department of the same place; after which I called upon Dr. Grice, president of the health board of Portsmouth, also Dr. Hope, who has charge of the local quarantine of the Elizabeth River; then to the police department of Portsmouth. To all the above I told my position and instructions, and they kindly said that they would keep me posted as regard any refugees, suspicious cases, or yellow fever occurring in their districts. Furthermore, to keep myself thoroughly posted, I made it a point to visit both cities each day and was in constant telephonic communication with them.

On August 1 four refugees from Hampton were found in Berkley and sent back to Hampton. Between this date and the raising of the quarantine there were six refugees found in Berkley, all of which were sent to the detention station on Craney Island.

On August 4 there were found four refugees in Portsmouth, and between the above date and the raising of the quarantine one more refugee was found, making five altogether which were sent to Craney Island.

On August 10 I received telegraphic orders to proceed immediately to Suffolk; from there to Emporia and Bellfield; also to any other places that I thought proper, to try and locate refugees from Phoebus and the Soldiers' Home. I visited the above-named places; also Franklin and James River Junction, each of which I made as thorough an examination as possible, but failed to locate anyone.

On August 14 I returned here. Since my return have inquired in both cities each day for any suspicious cases of fever, but so far have found none.

Very respectfully,

R. R. FARQUHAR,

Acting Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

YELLOW FEVER IN LOUISIANA AND MISSISSIPPI, SUMMER AND FALL OF 1899.

The statistics with regard to this disease in Louisiana and Mississippi in the fall of 1899 have been previously inserted in the statistical portion of this report under the head of division of sanitary reports and statistics, see page —.

The concealment of the disease in New Orleans is made evident in the following pages, and it will be observed that between the issue of the Public Health Reports of June 2 and September 8 no cases of fever were reported. A running history of events as they transpired within the ken of the Service is found in the following extracts from the weekly Public Health Reports and in the complete report of Surg. H. R. Carter, who was ordered from Cuba to take charge of Service matters in connection with the yellow fever at New Orleans. The measures necessary being partially coincident, but for the main part following closely upon the epidemic at the Soldiers' Home, and the activity necessary on account of the yellow fever in Florida prevailing at the same time, sufficiently indicate the responsibility and the labor which were thrown upon the Bureau and those officers of the Service who, by reason of experience and special adaptability, were the agents of the Service at the scenes of action.

DAILY RECORD REGARDING YELLOW FEVER.

[From Public Health Reports of June 2, 1899.]

A CASE OF YELLOW FEVER REPORTED IN NEW ORLEANS.

President Souchon, of the Louisiana State board of health, reported from New Orleans, May 30, as follows: "One case of yellow fever positive in city; case isolated; all precautions taken; autopsy affirmative; send inspectors." He also reported the same date that the State of Texas had quarantined against New Orleans, and requested that an officer be sent to take charge of the disinfection of freight. In response to these telegrams Surgeons Murray and Carter and Assistant Surgeon Von Ezdorf were at once ordered to New Orleans. Surgeon Murray will act as consultant and expert, and Surgeon Carter will join him there as soon as he can return from Cuba, where he has been inspecting the ports and establishing the quarantine service. Surgeon Carter left Habana June 1 direct for New Orleans.

Assistant Surgeon Von Ezdorf, who is an immune, will rejoin his station in New Orleans from his tour of inspection. Passed Assistant Surgeon Nydegger has been ordered to take charge of the disinfection of freight in New Orleans. No new cases have been reported since the one of May 30.

[From Public Health Reports of September 8, 1899.]

YELLOW FEVER IN NEW ORLEANS.

September 8, 1899: Dr. Edmond Souchon, president of the Louisiana State board of health, reports as follows: "One new case, mild, making third only. Isolated and under control. Second case convalescent. Returns from 75 physicians show no other case. Inspection continues. State board was in session to-day—parish members present. Decided quarantine not necessary."

[From Public Health Reports of September 15, 1899.]

September 10: Surgeon Murray telegraphs from Jackson, Miss., that 1 case of yellow fever is reported in that place at noon by the health officer.

Dr. H. A. Gant, State health officer of Mississippi, reports September 9 from Mississippi City no new cases, and that the isolation of cases is perfect.

September 11: Surgeon Carter wires from Key West: "Leave for New Orleans to-night."

Acting Assistant Surgeon Ballard is telegraphed at Natchez as follows:

* * * "Begin at once personal inspection of all vessels arriving at Natchez from New Orleans. If anything found, report by wire."

The same orders are sent Acting Assistant Surgeon Robbins at Vicksburg as to vessels from New Orleans for Vicksburg, and Acting Assistant Surgeon Laws regarding vessels arriving at Memphis from New Orleans.

Surgeon Magruder is telegraphed as follows:

"Have ordered Carter to New Orleans. In the meantime establish at once train-inspection service on all trains leaving New Orleans. Nydegger ordered to report to you."

September 12: Surgeon McIntosh, at Mobile, was directed to make arrangements to give certificates as to freight originating in noninfected territory and sealing cars for Texas via New Orleans, and have railroads pay for labor, pasters, and other expenses.

Dr. Souchon, president of the Louisiana board of health, telegraphs that there have been 7 cases of yellow fever in all in New Orleans. Assistant Surgeon McAdam reports from Key West 29 new cases and 1 death for September 12. Surgeon Murray reports for New Orleans 2 fatal cases, 1 recovery, and 6 being treated.

September 14: Surgeon Murray reports at Mississippi City 4 new cases, no deaths. Two other houses suspected.

[From Public Health Reports of September 22, 1899.]

September 14: Assistant Surgeon McMullen, at Memphis, Tenn., is directed to assume temporary charge of the Service there and supervise the inspection of steamboats from New Orleans, using Acting Assistant Surgeon Laws for this purpose.

Assistant Surgeon McMullen, at Memphis, reports as follows:

"In pursuance of Bureau telegram of the 14th instant, in which I am directed to assume temporary command of the Service at this port and to supervise inspection of steamboats from New Orleans, I have the honor to state I have conferred with Dr. Haase, secretary of the city board of health, and the following plan has been agreed upon:

"As it is difficult to find out when a New Orleans boat is to get here, Dr. Haase

has promised to have the police notify me a few hours before a New Orleans boat is to dock and to see that a sufficient number of police officers are present to prevent anyone landing before the inspection is made.

"Previous to my arrival here the city board of health ordered that on and after September 13 no water craft coming from New Orleans or other port where yellow fever exists, would be allowed to land at Memphis without a clean bill of health from the United States Marine-Hospital Service. A previous order forbade the landing of household goods from New Orleans under any circumstances. A copy of this order has been forwarded to the Bureau from this office. Acting Asst. Surg. J. W. Laws has been instructed to make these inspections and, after seeing everyone on board, to give such certificate as he is able.

"I am informed by Dr. Haase that New Orleans passengers and freight are occasionally transferred between New Orleans and Memphis to other boats for different points along the river, including Memphis, and in this way passengers reach here from New Orleans by other boats and are not inspected.

"I understand that a very limited number of boats are now running between Memphis and New Orleans direct, owing to the low water."

September 16: Surgeon Carter reports from New Orleans—

"One case same district yesterday. Magruder goes to Jackson to confer and arrange train inspection; he will be absent a week. Inspection of steamboats for the upper river points is being done; no passengers are taken. Boats put in good order, freight inspected, and if insanitary, rejected. Schooner for quarantining portion of the Mississippi coast disinfected and held. No restriction on merchandise from wholesale district needed and none imposed.

September 18: Surgeon Carter reports that Surgeon Magruder is arranging train inspection—one complete system from the Mississippi River to the Louisville and Nashville Railroad. * * * He reports 1 new case of fever—that freight traffic is practically unobstructed, save that no freight originating in New Orleans is received in Texas. New Orleans freight allowed passage through Texas and freight through New Orleans received in Texas. Very few unnecessary restrictions; he meets Sanders to-morrow to simplify train-inspection service; everything running smoothly.

September 18: Surgeon McIntosh, at Mobile, is directed to report by wire to Surgeon Carter, at New Orleans, for orders. Duty will be to operate train inspection from outside.

September 19: Surgeon Carter reports 2 new cases of yellow fever in New Orleans in the same house in the upper residence portion. Weather very unfavorable for the spread of the fever.

[From Public Health Reports of September 29, 1899.]

New Orleans.—Official reports from New Orleans are as follows:

"September 20, 2 new cases; September 21, 3 new cases, 2 deaths; September 23, 1 new case. Total cases to date, 18; total deaths to date, 7."

Surgeon Carter reports as follows:

"September 22, no new cases, 2 deaths; September 25, 3 new cases, 1 death since Saturday."

September 26, 2 new cases. He goes to Memphis to-night, thence to Meridian for train inspection, and advises that McMullen attend the Memphis end of it; September 27, official reports, 2 new cases; September 28, 2 new cases.

[From Public Health Reports of October 6, 1899.]

New Orleans.—Surgeon Carter reports as follows: September 29, 3 new cases; September 30, 1 new case. Tennessee has raised quarantine permanently after having frost last night.

Official reports are as follows: October 3, 2 new cases in past forty-eight hours.

Weather cooler. Thirty-three cases to date, 10 deaths, 11 under treatment; October 4, 5 new cases, 1 death; October 3, Surgeon Murray is ordered from New Orleans to Miami, Fla.

Centerville, Miss.—Surgeon Murray reports as follows: September 29, 2 cases direct from New Orleans.

Mississippi City.—September 29, total cases to date, 26; 1 death.

Jackson.—Dr. Hunter reports as follows: October 2, 12 cases reported to date—4 deaths. Six foci fairly scattered in town. Origin of infection unknown. No objection to publicity.

I submit below the report of Surg. H. R. Carter upon the outbreak of yellow fever in New Orleans, in 1899:

REPORT FROM SURGEON CARTER ON CONDITIONS IN NEW ORLEANS AND JACKSON, MISS.

NEW ORLEANS, LA., *October 13, 1899.*

SIR: It is hard to gauge accurately the progress of the fever here. The State board gives us such reports as it gets, and a certain proportion of cases are reported. I was informed, however, from private sources, that there was a very considerable spread of fever in their practice and among the physicians in their neighborhood for the seven or ten days preceding the 5th or 7th of this month. I can vouch for the credibility of my informants as far as their own knowledge is concerned, but I can not vouch for their experience being general, even in their own section of town. Since the 7th I am informed the fever has declined.

I am informed that the usual type is exceedingly mild; that a number of cases occur which, by themselves, had been incapable of diagnosis, but occurring in conjunction with others, and under such conditions that infection seems plain, they were regarded as yellow fever. It all seems confined to the residence portion of town, between Canal and the Park, mainly away from the river and above Meleponene. No cases have occurred, or at least been reported, on vessels, American or foreign, and only 2 that I know of among railroad men.

I judge that the hospitals are not taking yellow-fever patients; in one case, certainly, a case of this kind has been declined.

The situation at Jackson is well under control. The fever is being well reported there, and when reported those exposed to it go to northern points or to the camp, which is a factor in the slow spread in that town, although I ascribe much more to the late cold weather than to this.

In spite of the change of the weather, for it has been hot and damp for several days past, it is not reasonable to believe we can have any marked increase of fever at either Jackson or New Orleans.

Respectfully,

H. R. CARTER, *Surgeon, M. H. S.*

SURGEON-GENERAL.

REPORT ON THE YELLOW FEVER IN LOUISIANA AND MISSISSIPPI, SUMMER AND FALL OF 1899.

By Surg. H. R. CARTER.

NEW ORLEANS, LA., *November 3, 1899.*

SIR: With the time at my disposal I will not be able to make any satisfactory report of the fever that has prevailed in this part of the South this year, but a very brief résumé of the most salient points may be of interest.

1. *Its origin.*—On this I have attempted nothing, nor do I think that any systematic attempt has been made to trace it. Most of the physicians I have heard speak on this subject have ascribed it to a recrudescence of the fever last year. I

confess that this was a surprise to me on account of the very severe winter intervening, and I can not say that I am altogether willing to accept this theory, yet I have nothing to offer as a substitute, and no special reason to discredit it, save the belief that cold will destroy infection and that it was very cold. The argument made is briefly this:

(a) The type of the fever: The fever is said by all whom I have heard speak of it to be very mild and generally of the same type of fever that prevailed in 1898, while the fevers which have existed in Vera Cruz and Cuba this year have been at least of average severity; that at Vera Cruz having been particularly malignant. How much stress should be laid on this argument is difficult to determine, for yellow fever not unfrequently changes its type in transmission from place to place, or even in the same place from lapse of time. Still, in general the type is preserved and the argument, if not conclusive, is sound.

(b) The occurrence of a case (the famous Grillo case) in the latter part of May: There are also reports of yellow fever here in July, mainly from lay, but one at least from a professional source. I do not vouch for their accuracy, and indeed am inclined to lay a little stress on them.

(c) The occurrence of a number of cases in houses where the fever occurred last year. This is alleged to have been the case by those advancing this theory.

I am not convinced by the above arguments, but must admit that they have considerable force.

That fever may recrudescence late in the season, we have the instance this year of Habana, and especially in the Cabanas. There is no question of the fever in Habana being a recrudescence from infection left over last year, yet the city was practically free from fever until the end of July. One case was reported in June; I think none in May, and none until near the end of July; while August gave considerable mortality; the same among civilians as in 1897 and 1898, with a decided increase in September. In the Cabanas there have been about 600 nonimmune soldiers stationed the whole year with, as far as it could be compelled, absolute nonintercourse with Habana, admitting that this was impracticable, yet the fever occurred there (the first case being August 10) under such circumstances that it was admitted to be a recrudescence from last year's infection in Cabanas: 23 cases occurring in quick succession before the troops were moved. If a recrudescence, it is somewhat surprising that there should be no fever, save the Grillo case, below Canal street. Also, against this origin is the fact that instead of fever showing simultaneously, or nearly simultaneously, at a number of places in town, it seems to have spread from a focus somewhere about Coliseum and Terpsichore streets, with other foci of spread established later.

Again, while it is true that a number of cases of yellow fever did occur in the same houses in which fever existed last year, yet I do not find that these were the earlier cases, nor that this was so general that they could not reasonably have been ascribed to other foci of infection then known to exist in town.

But for the Grillo case the balance of evidence would seem to the writer against the theory of recrudescence. Considering this case and the absence of any knowledge of direct importation the matter is more in doubt.

I do not know what was the origin of the yellow fever.

2. *Type of fever.*—Up to to-day there has been a total of 71 cases and 20 deaths reported in New Orleans, which would give a mortality of 28 per cent. Several of these cases are still under treatment, and 1 more death would give a mortality of 30 per cent. This would imply an extremely severe type, and is untrue. All of the cases are not reported, it being especially the light ones that escape. No one has estimated it to me as being more than 5 per cent, and the general opinion is that it is decidedly light, many speaking of it as being from 2 to 2½ per cent; but these estimates are made without any accurate data, and are rather guesses than estimates.

The death rate in Louisiana was extremely low last year. In Franklin, La., where an accurate, or fairly accurate, enumeration was made, it was a little over 1 per cent. In Mississippi City this year, where we were able to see practically all the cases, the death rate was practically nil, 1 old person dying out of 70 cases. Yet the disease in Mississippi City was diagnosed by competent authority and was yellow fever. In New Orleans I can only guess at it, but, as I say, no one has placed it, as far as I know, over 5 per cent. In Jackson, on the contrary, it was fairly heavy.

3. *Progress of disease.*—The weather from the 20th of September to the 2d of October was cold, not cool. The temperature fell in Jackson to 42° one day and 43° in two preceding days. In New Orleans the lowest temperatures were 56° and 57°. After this time the weather became fairly warm, until on the 9th of October it was distinctly hot, and hot from that time until the 23d, showing about the same temperature we should expect in September, from 68° to 76° as a minimum and from 88° to 90° as a maximum.

In Jackson it was dry during the whole of this time. In New Orleans a little rain fell about the middle of October, but the weather was distinctly dry up to the present time. The weather on the whole was distinctly unfavorable for the rapid spread of the fever. We would expect it to spread slowly, or until the effect of the cold spell had passed, and then spread rapidly, and that the effect of the cold spell should be more marked in Jackson than in New Orleans.

Jackson, Miss., in its reports of cases gives nearly what we should have expected. The first case of fever was reported about the 8th of September. Sixteen cases were reported up to October 10, rather less than the number one should expect from infection introduced August 22, the date given by the Mississippi board. Then, apparently from the effects of the cold weather, there were no cases reported between the 13th and the 19th, when three cases were reported and the fever rapidly increased, and from that time on from four to eight cases per diem were reported until cold weather. I am informed by Dr. Hunter that there were some cases in Jackson so mild that it was difficult to diagnose them during this apparent absence of cases.

On the other hand, an examination of the reports from this city—New Orleans—does not show as one would expect. From September 15 there has been an average of one or two cases reported here per day (62 cases in forty-eight days), and the daily average has been nearly constant. It is worthy of note, too, that while the number of reported cases per day has but slightly increased from the beginning, that the area over which they have been reported has been largely extended, there being probably a normal extension of area. It is sufficiently remarkable that there should be such an increase of localities in which yellow fever occurred (presumably establishing foci of infection) without increase of cases of yellow fever. I offer no theory in explanation of this fact.

The area in which infection was first found to exist was a small one bounded by Terpsichore, Coliseum, Felicity road, and Dryades streets, comprising probably eight or ten squares—at least nearly all of the cases reported for some time occurred in this district. Another considerable bunch of cases was reported early higher uptown near Napoleon avenue, about a mile and a half from the first, and before the season was over the cases had been pretty well sprinkled over the upper portion of the city, say, between Howard avenue and the park, nearly all of them, however, being between Napoleon avenue and Clio street. No fever was reported on the business part of the river front, and it is believed that none occurred south of Canal street—at any rate until late in the season. One of the causes in the sharp delineation of this district is the social conditions which prevail here. There is at this season little greater communication likely to spread yellow fever between the districts above and below Canal street than between two neighboring cities.

It is fair to say that many cases were not reported by physicians. This is not

even a sec et. A comparison of the mortality of reported cases with the estimates of practitioners will show that they think this. The considerable number of cases reported as yellow fever whose deaths were reported next day also, I think, shows a disposition not to report if avoidable; and I have heard a number of practitioners speak freely of cases which they had not reported. Admitting this, I am confident that the areas that I have given as free from fever are free, or mainly free, from it. I have no data on which an estimate of the number of cases can be based. I prefer not to guess.

The fever in Jackson, for about five weeks from the first case reported, was confined to the better class in northeast Jackson, including servants of that class, and the sanitary measures instituted—depopulation of infected houses, isolation of cases, and disinfection, carried out very readily with this class of people—were, I believe, of value in lessening the rapidity of spread, which at the time of the year it occurred was equivalent to advancing the date of frost.

In New Orleans isolation and disinfection were practiced, but those exposed did not in general leave the house, and owing to the considerable proportion of cases not reported were of less value than in Jackson.

Besides New Orleans and Jackson, yellow fever was also reported at Mississippi City, Pass Christian, Flora, Centerville, Miss.: and Plaquemine, near Baton Rouge, and St. Charles, La. The cases at Pass Christian, Centerville, Plaquemine, and near Baton Rouge were in people directly from New Orleans. I am informed the same is true of the cases at St. Charles, but have not verified the report. Of the above places, Centerville was the only one quarantined when fever developed.

The health officer at Mississippi City and Dr. Gant, the agent of the Mississippi board of health, and I believe Dr. Murray of this Service, ascribe the case at Mississippi City to infection from New Orleans, stating that the first case occurred in a child immediately from New Orleans, it sickening the evening of arrival. The infection of Flora was from Jackson, Miss., direct.

The first case reported since the Grillo case in May was in Mr. Adolph, a student, who was reported August 28. This gentleman had not been out of New Orleans for a long time, and undoubtedly contracted the disease here. No relation could be traced between his case and the next half dozen or more cases reported soon after, and we think there was no casual relation between them. The next case reported was on September 1, about 2 miles distant from the first. The Adolph case then—unless we accept the theory of a recrudescence—was certainly not the first one. The theory of the Jackson fever to be given later, if correct, implies the existence of fever here about the middle of August.

It may be interesting to give the early history of the Jackson fever in detail. I quote entirely from the State and city boards of health, Drs. Hunter and Harralson of the former, and Dr. Todd, health officer of Jackson, and Dr. Harriston, city physician.

The first case reported was Maj. Price Porter, who sickened with yellow fever on September 8. The diagnosis was confirmed by autopsy. No other case was known to be in Jackson at that time. His brother, Joe Porter, however, had been sick with a fever, having a night chill, extreme prostration, and other symptoms which led my informants to believe that it was yellow fever. He sickened on the 22d of August, a few days after his return from New Orleans. While at New Orleans he had visited a friend's house on Terpsichore street, in the immediate neighborhood of some of the earlier reported cases, this friend being recently convalescent from a fever. His brother, Maj. Price Porter, nursed him (Joe Porter) during his sickness, and himself sickened in a different house from the one in which Mr. Joe Porter had been sick. This house (Major Porter's) was disinfected, Mr. Joe Porter went to Chicago after his sickness and returned to the house he originally occupied. In this house on the 27th of September Mr. McGee Porter, another brother, was taken sick with yellow fever, and within a short time,

before and after the 27th, all the whites in the house (5), save Joe Porter himself, had been taken sick with fever which, however, was not diagnosed by their physicians as yellow fever. Joe Porter never became sick—that is, a second time. Among the visitors to this house prior to and during the sickness of McGee Porter the disease made its appearance.

It is alleged that one or two practitioners who had a number of the earlier cases did not regard them as yellow fever, and that thus all chance of suppressing the fever in the beginning was lost. A laundry too, became infected fairly early, and from this time it is hard to trace its spread. It is a pity, for if the theory of the Mississippi board as to its introduction be correct, and it seems to be, this fever could have been suppressed.

In Jackson a "camp for suspects" was opened by this Service for those who were in the houses in which cases of yellow fever were being treated and who wished to leave such houses. This consisted of 50 tents and the usual arrangements for disinfection, cooking, eating, etc. It was not a "detention camp" in the usual sense of the word and few guards were required. It was very generally used, a large number of people directly from "sick houses" availing themselves of it. It was well managed and its use being entirely optional, although strongly advised, it was decidedly popular. I think it was of considerable value in lessening the spread of the fever. Most of the people who came to it, came within a few days of the occurrence of the fever at their houses, and there was only one doubtful case of fever developing there. This was in an infant and probably not yellow fever. This illustrates, what we have so often asserted, that people moved from houses in which yellow fever exists soon after the development of the fever, seldom develop yellow fever.

4. *Quarantine.*—The States of Texas, Mississippi, Alabama, and Florida quarantined, as did west Tennessee and a considerable portion of Louisiana, all save the parishes of the "sugar district," and "Florida parishes;" some of these (about one-half of them) later in the season put on a modified quarantine on persons, to be explained later. The coast towns in Georgia and South Carolina put on a quarantine against "persons and household goods."

Of course, when it was seen that cases were arising in New Orleans whose origin could not be traced—that is, that all those who had been exposed to infection were not under observation, some surveillance or restriction (quarantine) on passenger travel was justifiable and indeed requisite. I do not think that it was ever requisite during this fever to restrict, or at most to very slightly restrict, the movement of merchandise from the wholesale district.

Mississippi did not quarantine on the report of the first case; not until it was plain that cases were arising whose origin could not be traced—that is, that some of those exposed to infection were not under observation, and hence could develop yellow fever elsewhere, and indeed not until one such case—quoting her health officer—had already developed a case of yellow fever in Jackson.

About this time and later on a considerable portion of Louisiana also quarantined. Texas and Alabama quarantined early, west Tennessee and the South Atlantic coast about September 15 and later.

RESTRICTIONS ON PASSENGERS.

The quarantine was absolute in all of the above-mentioned States and parishes against persons immediately from New Orleans, and on baggage. Persons, immunes to yellow fever, were accepted, I believe, universally, save at Shreveport, La.

By the advice of the writer, in place of an absolute quarantine against persons, there was a modified quarantine instituted by a considerable portion of the "sugar district," and places in West Feliciana and East Feliciana—that is, no objection was made to persons coming from New Orleans bearing a certificate from this

Service that they were not from the "infected district" of the city, on whose limits we tried to keep well informed. I do not know of another instance of a division of a city in which yellow fever is prevailing, for the purpose of quarantine of persons, unless one part of the city is quarantined against the other. It is not pretended that this was entirely safe; but, with the degree of infection that we had this year and its somewhat sharp limitation of area and the social conditions which prevail, it was fairly safe, I think sufficiently so, for the places adopting it. It worked very well, though adding considerably to the duties and responsibilities of this office. No development of fever was reported in any of the places under this rule, and indeed in but few which had unrestricted communication.

As I have said, the restrictions on persons for the district quarantined against New Orleans, save as above-mentioned, were uniform—being absolute; that against merchandise was not. Mississippi; west Tennessee; the quarantining section of Louisiana; and, in the beginning, Alabama, agreed to receive merchandise certified by this Service as being under the rules of the "Atlanta convention" of 1893. Alabama, on September 27, made some modifications in these rules, restricting them somewhat.

We were able to keep very close watch on the "wholesale district" of the city, and to assure ourselves of its freedom from infection. One case only was reported there, and this arose elsewhere and was so handled as to form no focus of infection. A very large amount of merchandise was shipped to these quarantining points, and save for the Texas quarantine, which is to be spoken of later on, the commerce of this city was but slightly interfered with; not much more, I think, than was unavoidable under the conditions that prevailed. Commercial travelers from the city could not go into quarantining territory immediately from New Orleans, and this may have lessened sales. There was very little bar to shipment of the usual kind of merchandise, but the wholesale men claim to have done nearly their full business in Mississippi, Alabama, and Louisiana. The retail stores, of course, suffered to some extent.

Texas forbade entrance to any merchandise originating in New Orleans, and all shipments to that State (which are very considerable) were cut off. On the other hand, she placed no bar on freight by steamer from New York transferred directly to cars in Algiers, a portion of New Orleans across the river, or to through freight coming in cars from other roads, the cars being transferred here unopened; also, she allowed freight originating here to pass through her territory to points beyond willing to receive it, and took freight and passengers from all points other than New Orleans in Louisiana, whether these places were quarantined against New Orleans or not. So that a person could leave New Orleans, spend ten days in a portion of the country not quarantined against this city, and on proof of this would be allowed entry into Texas; she also allowed passage through her territory and entrance therein to through passengers from uninfected points passing through New Orleans on direct connection of trains. These were transferred directly across the river from the Louisville and Nashville trains to the Southern Pacific Railroad. None of this commerce was permitted in former years, and any places not quarantined against New Orleans were barred as much as New Orleans itself. Unquestionably the total prohibition of all freight was unnecessary, and this rule might have been much modified without any danger to the health of the State being incurred. Still, the change toward a more rational quarantine in the case of Texas is, as compared with past years, as great if not greater, than those of the other States, Mississippi and Alabama, Georgia and Florida, whose original restrictions in 1897 were far less sweeping.

It was understood that the report of a single case of yellow fever in Algiers would have resulted in the stopping of all this movement of through freight. As this would have thrown about 2,600 men out of employment, all living in Algiers, it was tantamount to offering a great inducement (1) to keep fever out of Algiers; (2) to conceal any case which might occur.

I do not know that any occurred there; I think not, but with this inducement to conceal it seemed utterly hopeless to inquire.

It is worth remarking that we now find that there was a large amount of merchandise shipped from New Orleans to Texas illegitimately, via St. Louis and New York. This consisted especially of dry goods, woollens, clothing, and notions. If any class of goods from the wholesale district were dangerous these were. Some of the largest houses here tell me they have done their usual Texas business this season through St. Louis and New York, and simply complain of the extra freight.

The effect of the Texas prohibition of all merchandise from New Orleans closed the ordinary routes by the Southern Pacific and Texas Pacific railroads, and merchandise like machinery, iron, wholesale groceries, etc., were absolutely shut out. Their value is small compared with their weight, and they could not bear the excess of freight by indirect routes, while dry goods, woollens, clothing, etc., far more valuable in proportion to their freight, could easily do so. The effect of this prohibition of all merchandise from New Orleans was, then, to exclude absolutely what was most safe, without debarring the class generally looked upon with most suspicion, which indeed went without sanitary supervision. I think, however, no risk was taken in the receipt of any usual freight from the wholesale district in New Orleans this year.

The health officer of Texas was willing to admit and favored admitting certain classes of merchandise from New Orleans, believing that they would not convey infection, but refrained from doing so because he believed that a step of this kind would cause some communities already restive to put on a quarantine of their own of greater stringency than the State had and seriously obstruct commerce, as did Orange last year.

No infection was ascribed, so far as I have heard, to any freight shipped under the supervision of this Service this year, or indeed the previous two years.

It is claimed that the quarantine laid by the parish of Calcasieu later in the season was done at the instance of Texas, to preserve the trade of this parish with that State. This I do not know, but think it not improbable, as the trade relations between the two are very close. The restrictions which Calcasieu first placed on merchandise amounted virtually to prohibition: that is, she required a "thorough disinfection by the Marine-Hospital Service of all merchandise received." This I declined to do, offering to ship nothing undisinfected which could convey infection. This was agreed to, and their merchandise was handled under the same rules as that of the rest of the quarantining part of the State.

That part of the Mississippi coast west of Scranton is, with the exception of Gulfport and the partial exception of Biloxi, closely allied in interest with New Orleans—it being, save Biloxi and Gulfport, in the summer simply a resort for New Orleans people. In addition, except Mississippi City, a very small place, and Pass Christian, the population was almost entirely immune to yellow fever from the epidemic of 1897. These people then were anxious to continue their communication with New Orleans, and the State board of Mississippi had agreed to consider that part of the coast from and including Pass Christian west as a suburb of New Orleans and allow unrestricted communication, quarantining the rest of the State against it. The location of the line of division is determined by the location of Gulfport, which did not desire this communication, and from which a railroad runs up into the heart of the State.

About the 20th of September, the towns of Biloxi and Ocean Springs having requested the same communication, the State board of Mississippi authorized Dr. Gant, of that board, and myself to arrange for it, so as to meet the views of the coast people and not endanger the remainder of the State. Free communication was offered under certain conditions, but it being at this time held to be more desirable by Biloxi to hold communication with Mobile than with New Orleans,

the proposition was declined. The interests of this part of the Mississippi coast and its relations to New Orleans, and the interest of the rest of the State of Mississippi, through Ship Island to Mobile, is a somewhat intricate sanitary problem, but not an insoluble one, I think.

On my arrival, September 14, the first order issued was to prohibit "package mail" from leaving the city for any place in the South, except parishes in Louisiana directly communicating with New Orleans. This order was at first well carried out by the post-office until some time in October, when, on account of receiving some such packages by an ill-advised clerk, inspectors of this service were placed in the post-office, through whose hands all mails for places under quarantine passed. There was no trouble whatever with the mail this year, and the only disagreeable episode was due to the mistake or disobedience of one of the post-office employees above alluded to. The package that was sent illegitimately was fortunately a registered package, which could be easily traced and proven that it had been so sent.

The same inspection was instituted for express as for freight, and it was shipped under the same rules. It was many fold more troublesome.

And here let me say that in general from an infected city large enough to have a wholesale district, the class of merchandise shipped by mail or express is many fold more dangerous than that shipped by freight. The latter is practically all from the wholesale district, a large proportion of it wholesale groceries in original packages, machinery, food stuffs, etc., little apt to carry infection. By express and mail, on the contrary, are shipped goods from retail stores, especially fabrics, garments, etc.: from residences, articles of clothing, second-hand newspapers, etc. Merchandise from residences especially goes by mail. Fortunately an enormous express business is done from this place in fruit, California and tropical, by direct transfer. This was safe and was not interfered with.

An inspection of passenger trains on many of the railroads running out of New Orleans had been put on prior to my arrival, with more or less uniformity of rule, by the different health authorities, State, parish, and municipal, along their routes. That of the Mississippi and Alabama State boards were good services, efficient and nonobstructive. That they did not run in coöperation with each other, and that their regulations were somewhat different, caused a few times a lack of smoothness in the Service at State lines, and some (I think undue) criticism from passengers. By agreement with and at the request of the State and other health boards the whole business of this interstate train inspection, and indeed all interstate work, was assumed by the Service. There was very little change needed in the organizations.

An inspection of all railroads running out of New Orleans was now made, with relay camps for train crews, guard tents, train inspectors, etc. This matter was somewhat costly and troublesome enough, but was efficient, and enabled passenger traffic to be carried on safely, with practically no inconvenience and disturbance. Indeed, the community in the Gulf States is so well educated in the matter of "health certificates," and what they may do and may not do, that a train inspection now is a far easier thing to organize and carry on smoothly than it was in 1897. The only untoward incident that came to my notice was the refusal of entry into west Tennessee of a number of passengers who should have been passed, by an inspector who seemed to think his duty was rather to collect health certificates than to bar people recently from infected places. He was promptly removed.

This work was immediately under Surgeons McIntosh and Magruder, the latter, stationed in New Orleans, having charge of the relays (except that at Pascagoula) on the Louisville and Nashville, and all work inside the quarantine line, McIntosh being in charge of the train inspectors proper outside the quarantine lines, and of the Pascagoula camp. The lower division on the Illinois Central and Mississippi Valley fell to Magruder, while the upper portion of these lines were directly under

McIntosh. An officer was stationed at Memphis, and an agent on the Mississippi board acted for us at Meridian during McIntosh's absence. McIntosh's headquarters were at Meridian.

In this, the New Orleans division, fell the handling of those immune to yellow fever who wished to leave the city, and who in their own judgment comprised about three-fourths of the population of New Orleans, and all visiting strangers. The general method was as follows: The evidence of immunity was presented to this office, which passed on it by indorsement, favorable or unfavorable. If favorable it was then transmitted to the health officer of the place to which the alleged immune wished to go, who at his discretion advised me if the man could come. If he could we disinfected his baggage and in general his wearing apparel, and gave him a permit to pass the train inspectors. For Mississippi (except Vicksburg) and the quarantining parts of Louisiana (save Shreveport, which did not take immune certificates) the decision of this office was final, and the evidence was not sent to the local health officer. This was done at the request of these health boards, and was simply a saving of time, as in no case was our indorsement of immune certificates not recognized. I will say here that this is among the least agreeable works I have ever been engaged in, as no person understands why an exception can not be made in his and especially her favor, or why common report or the opinion of friends (unknown to me) can not be taken as to the diagnosis of disease they had suffered in uncertain years in New Orleans and elsewhere; in many instances in localities and years in which we know no yellow fever prevailed. Probably 7 to 10 per cent of those applying were accepted. This work was my personal care.

For the determination of what merchandise could be shipped under the restrictions, inspectors were appointed at the different freight depots, and this work was carried on, I believe, satisfactorily to the end of the season. It was immediately under Passed Assistant Surgeon Nydegger, as was the express.

The express gave us decidedly more trouble in proportion to its value than the freight, and of the freight the fruit men troubled most, many being barred for attempted fraud.

The same rules for freight on vessels were put in operation as on railroads, and all vessels leaving the city for quarantining points were inspected before loading and made clean, if necessary disinfected. By inspection we determined that only the proper kind of freight had been taken and that the crew was well when starting. A certificate to that effect was then given. As, however, it was impossible to relay the crew, as was done on the railroads, there was more trouble, especially at a few Mississippi points, with commerce by boat than by rail. This was immediately under Acting Assistant Surgeon Scott, who also had charge in 1898.

For the commerce that goes by the lake, which is large in amount, at least in number of vessels and the men engaged in it, these vessels were disinfected at New Orleans, the freight properly selected and where necessary disinfected, and arrangements made by which they could lay their quarantine at the Rigolets under supervision of a medical officer there appointed acting assistant surgeon of this Service. This was far better than the arrangements of previous years by which quarantine was laid at Ship Island quarantine. This place, Ship Island, at this season of the year is no harbor for small vessels, and the risk of such being wrecked there is very great, leading to a general disposition to evade quarantine.

Raising quarantine was more satisfactory than in any preceding year.

The cold spell in September and early October gave frost in west Tennessee and north Alabama, and quarantine was raised in Tennessee on October 30 and in Alabama north of the thirty-fourth parallel, passing through Gadsden and Atala, on October 4.

At this time we confidently calculated on an early termination of our troubles, but the weather turned hot, and there was no weather which gave even an excuse

to raise quarantine until the 25th. when I think it could have been safely raised in Mississippi and Louisiana. A cold spell showed, however, with moderate frost over Mississippi and Louisiana on the 30th and the 31st of October, and quarantine was raised on the latter day. This cold spell did not extend to the East, however, and Alabama, Florida, and the South Atlantic coast towns raised on the 3d and 4th of November, there having been a frost on the 3d. Texas raised the freight quarantine the same day and the prohibition on passengers one or two days later.

The principle on which quarantine against infected places may be raised by any place is that this second place is not a place infectible by yellow fever. When this condition is established, generally by time of year or temperature, there is no sanitary reason why such places should quarantine against persons, yellow fever being no longer an infectible disease for such places. The introduction of fomites, which may produce fever next year, is another thing and is to be considered separately.

This principle was generally acknowledged this year, which was by no means the case in 1897.

Household goods from infected places unless disinfected are still generally prohibited throughout the South, and there will continue to be scattering cases of yellow fever in infected places for some time longer.

Very respectfully,

H. R. CARTER, *Surgeon, U. S. M. H. S.*

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

YELLOW FEVER IN KEY WEST.

On the afternoon of August 31, 1899, a telegram was received from Asst. Surg. W. R. McAdam, in temporary command of the Marine-Hospital Service at Key West, Fla., to the effect that Dr. Sweeting, the State quarantine officer, had found two cases of yellow fever in the city and several suspicious cases.

Dr. McAdam was immediately directed by wire to see that the Treasury regulations were enforced at Key West and to prepare a list of people who had left Key West for the mainland within the past two weeks.

A similar request for identification of persons was made of both the Plant Line and the Florida East Coast Line of steamers on the west and east coasts of Florida, respectively, and these lists, which were subsequently obtained, were furnished to all localities which were interested to aid in the identification of persons who had left Key West during that period. On the same evening, August 31, a conference was had with representatives of the Plant Line of steamers in Washington, with the result that they agreed to take no passengers from Key West, and a telegram was addressed to the president of the Florida East Coast Line at St. Augustine, notifying him that vessels which usually leave there at night for Key West should not be allowed to go. Preliminary suggestions to both lines were made for the delivery of mails and necessary subsistence for Key West on floats some distance from the shore.

Surg. H. R. Carter, at that time in Habana, Cuba, was directed by telegraph on September 1 to proceed to Key West, in order that his

thorough knowledge of the disease might be available. He immediately obtained a tugboat and announced his arrival at Key West Saturday morning at 2 o'clock. Preparations were promptly made to open a detention camp, which was, after some consideration, determined to be placed on Tortugas. A commissioned officer and an acting assistant surgeon and one hospital steward were sent to Tortugas for that purpose. Preparations were also made, should it become necessary, to open a detention camp on Mullet Key, but this did not become necessary.

Upon the day of his arrival at Key West, Surgeon Carter began arrangements for a water guard around the island at the request of State agent Dr. C. B. Sweeting, which met with the approval of the State health officer, as may be seen by the following telegram received from him on September 2:

"Detention camps for nonimmunes from Key West at Tampa Bay and Miami wanted and will be appreciated. From the advices judge infection is very general over Key West, and proper method to check and stamp out is indicated by thorough depopulation of nonimmunes. Can you assist in effecting? Think can provide temporarily for Miami by river steamer, accommodating 36, on which new disinfecting plant is located, if you can help out in maintenance. Think island should be patrolled by water and prevent immigration of suspects to neighboring keys and mainland. I have no boat. *Germ* sold. Will arrive at Key West to-morrow afternoon."

The details of this water guard were two launches and a schooner at first, subsequently supplemented by another launch.

As may be seen by the report of Assistant Surgeon McAdam, which is appended hereto, but which is incomplete, owing to the untimely death of that officer, himself a victim to the disease, the fever was from the first (immediately after its announcement) uncontrollable, and when discovered had established foci in many different parts of the city. An idea may be formed of the rapidity of its spread from the report of Surgeon Carter, under date of September 5 and 6, on the first of which dates he reports 50 cases and 6 deaths, and on the last 64 cases and 6 deaths, while more followed within seven days of the announcement of the disease, indicating beyond peradventure that the disease probably existed for thirty days, and possibly twice that length of time, as it is well-nigh certain that not all of the cases were reported; in fact, it was well established later on in the epidemic that some of the physicians at Key West were not reporting cases.

On September 11, on account of an outbreak of yellow fever at New Orleans, it was necessary to order Surgeon Carter to that point, leaving the affairs in Key West under the charge of Assistant Surgeon McAdam, until his death, on October 12, 1899, when Surg. R. D. Murray, who had been ordered to Key West, assumed charge at that point.

Appended to Assistant Surgeon McAdam's letter of September 30

is a copy furnished by him of a letter to the city health officer of Key West, from one of the most prominent physicians in Key West, which letter is conclusive evidence that the first report of cases, viz, those of Browder and Egan, could not by any means have been the first cases of yellow fever in Key West. This report to the health officer stated distinctly that Dr. Fogarty had under his care on September 2 10 cases of yellow fever, of whom 4 were in the fourth day of the disease, 3 in the third day of the disease, the others at a period not stated, and that he had besides under observation 6 suspects.

Owing to the death of Assistant Surgeon McAdam from yellow fever in the midst of his investigations as to the probable method of ingress of the disease into Key West, and the inability of the Service to spare at that time another officer competent to make such investigations on account of the press of epidemic work elsewhere, no positive conclusion as to the method of ingress has been arrived at.

Other memoranda gathered by Assistant Surgeon McAdam, and bearing on the beginning of the epidemic in Key West, is also appended.

In controversion of the statements which appeared in the public press, the following official denial was published in the Public Health Reports of September 29, 1899:

THE INTRODUCTION OF YELLOW FEVER INTO KEY WEST.

[From Public Health Reports, September 29.]

In view of the allegations published in several newspapers, purporting to have emanated from official authorities of Florida, to the effect that the present epidemic of yellow fever in Key West is due to the "negligent inspection service of the Marine-Hospital Service" at Habana, and no disavowal by said authorities having been received or noted in the press, the Bureau deems it necessary to state that it knows of no evidence or facts which justify such assertions. The alleged facts and intimations, so far as known, have been thoroughly investigated and found to be without foundation.

The official report of the epidemic in Key West gives a total of 1,350 cases reported and 68 deaths. Inasmuch as the disease had been present in Key West about a month before its presence was made known, as will be seen in the following reports, it is not surprising that it appeared also in Miami and later a few cases at Port Tampa. The epidemic in Key West was officially declared at an end and quarantine raised November 24 by action of the State health officer of Florida, who required, however, that household goods and personal baggage from houses in which were cases of yellow fever should be disinfected or sterilized before leaving the island of Key West.

The following telegrams were sent and received by the Bureau on August 31, immediately upon receipt of Assistant Surgeon McAdam's telegram of that date, a copy of which is itself appended:

KEY WEST, FLA., August 31, 1899.

WYMAN, Washington, D. C.:

Sweeting reports two cases yellow fever in city; several cases suspicious.

McADAM.

WASHINGTON, August 31, 1899.

W. B. THOMPSON,

Attorney Plant System, 1621 S street NW., City:

Yellow fever reported in Key West. Will you meet me at Shoreham at 7 o'clock?

WYMAN.

WASHINGTON, August 31, 1899.

State Health Officer PORTER,

Jacksonville, Fla.:

Am informed Sweeting reports two cases yellow fever in Key West; several cases suspicious. What action has been taken to prevent spread?

WYMAN.

WASHINGTON, August 31, 1899.

J. R. PARROT,

St. Augustine, Fla.:

Yellow fever is reported by local quarantine officer in Key West. Pending further information Friday's boat from Miami should not go to Key West. Treasury regulations would require her disinfection and five days' detention, on returning, in quarantine. Same rule applies to vessels for Habana via Key West, but mail may be exchanged on lighter or small boat, but no person or freight taken from Key West.

WYMAN.

WASHINGTON, August 31, 1899.

Dr. HORLBECK,

Charleston, S. C.:

Dr. Sweeting reports two cases yellow fever Key West.

WYMAN.

Repeated to Dr. Brunner, Savannah Ga.; Dr. Sanders, Montgomery, Ala.; Dr. Souchon, New Orleans, La.; Dr. Rhett Goode, Mobile, Ala.; Murray, Marine Hospital, New Orleans, La.; secretary State board health, Jackson, Miss.; State Health Officer Blunt, Austin, Tex.

WASHINGTON, August 31, 1899.

MCADAM, *Key West, Fla.:*

Report immediately what steps are taken to prevent spread. Call Sweeting's attention to Treasury regulations interstate relating thereto. Wire report twice daily.

WYMAN.

WASHINGTON, August 31, 1899.

MCADAM, *Key West, Fla.:*

Very essential if any persons leaving Key West their destination be known. See ticket agent of steamers at once, and demand addresses before leaving. Request purser of boat to also make a list while en route and deliver to Altree at Port Tampa. Keep your own list until further orders, and wire compliance with order.

WYMAN.

WASHINGTON, August 31, 1899.

ALTREE, *Port Tampa, Fla.:*

Meet Key West boats, and get list of persons leaving there, with their destinations. Wire names to health officers of localities to which they are going. Sweeting has reported two cases yellow in Key West.

WASHINGTON, August 31, 1899.

CORPUT, Mullet Key, via Port Tampa, Fla.:

McAdam, Key West, wires that Sweeting reports two cases yellow fever in city; several cases suspicious. Be prepared to open camp. How soon can you do so? Be on alert regarding passengers on Plant Line.

WYMAN.

JACKSONVILLE, FLA., August 31, 1899.

Dr. WALTER WYMAN,

Surgeon-General M. H. S., Washington, D. C.:

Dr. Porter away from Jacksonville. Has been informed information here indicates dengue and not yellow fever. Sweeting will take necessary precautions.

FRANK B. MATTHEWS,

Secretary to State Health Officer.

CHRONOLOGICAL SUMMARY AS PUBLISHED WEEKLY IN THE PUBLIC HEALTH REPORTS.

The following extracts from the Public Health Reports present in a condensed form the operations of the Service throughout the period of the epidemic:

[From Public Health Reports of September 8, 1899]

YELLOW FEVER IN KEY WEST, FLA.

SEPTEMBER 2, 1899.

Thursday afternoon, August 31, word was received from Assistant Surgeon McAdam, marine hospital, Key West, Fla., that Dr. Sweeting, the State quarantine officer, reported 2 cases of yellow fever in the city and several suspicious cases.

September 1 (Friday). Dr. McAdam wires that 2 more suspicious cases developed last night at the hotel at Key West, and the inmates were quarantined. Last night he reported 4 new cases in different parts of the city, 1 moribund, and a number of suspicious cases.

Immediately on receiving the information, late Thursday afternoon, Dr. McAdam was directed by wire to see that the Treasury regulations were enforced in Key West, and to prepare a list of people who had left Key West within the last two weeks: made the same request of the Plant Line of steamers on the west coast of Florida and the Flagler Line on the east coast. As soon as these names are received the authorities at the places of destination will be notified in order that persons from Key West may be kept under observation for ten days. There should be no alarm caused by this measure, which is simply one of precaution.

The same evening the Surgeon-General had a conference with the representatives of the Plant Line steamers in Washington and they agreed to take no passengers at all from Key West. He also wired the president of the Flagler Line at St. Augustine, notifying him that the vessel which usually leaves Friday night for Key West should not be allowed to go, as the quarantine regulations would require disinfection and detention of the vessel on her return. Arrangements will be provided for delivering mails and necessary supplies to Key West on floats some distance from the shore.

The same night that we received the information (Thursday) the Surgeon-General notified all the quarantine officers of the South. He wired also State Health Officer Porter at Jacksonville for information as to what measures had been taken by the State authorities. In the meantime word was received from Assistant Surgeon McAdam, at Key West, that all possible precautions had been taken.

As it was deemed necessary to have an expert in Key West, Surgeon Carter, at Habana, was directed to proceed there for temporary duty. He immediately obtained a tugboat, and announced his arrival at Key West this (Saturday) morning at 2 o'clock. P. A. Surg. M. J. Rosenau takes his place temporarily at Habana.

September 2: Assistant Surgeon McAdam reports as follows: "One death last night, no new cases reported this morning. Surgeon Carter has advised regarding list of persons having left recently. Am canvassing hotels and boarding houses."

An agreement has been arrived at with the Navy Department by which some 60 marines and naval employees will be taken on board a naval vessel to Portsmouth, N. H.

The removal of the troops at Key West has been ordered by the War Department, but no information has yet been received as to the details. Surgeon Carter reports that the troops have been isolated and quarantined in their barracks since the first report of yellow fever. In the meantime preparations are being made to open the detention camp recently removed from Egmont Key to Mullet Key. It may not be necessary to utilize this camp, but preparations are nevertheless being made. Assistant Surgeon Corput is in charge of the camp on Mullet Key, and has Assistant Surgeon Trotter with him. Dr. Geo. A. Sheldon, an immune, has been ordered from Mobile to report at the camp. Hospital Steward Peck has been detached from duty at Hampton and directed to proceed to the detention camp at Mullet Key. Surg. G. M. Magruder has been ordered from Memphis, Tenn., to Port Tampa, Fla., to supervise the operations of the Service from that point. Acting Assistant Surgeon Altree, of Tampa City, in the meantime is meeting vessels arriving at Port Tampa and keeping close watch on all communications from Key West. P. A. Surg. W. G. Stimpson has been ordered from Old Point to Miami, Fla., to represent the Service on the east coast.

The State health officer telegraphs, September 2—

"Detention camps for nonimmunes from Key West to Tampa Bay and Miami wanted and will be appreciated. From advices, judge infection is very general over Key West, and proper method to check and stamp out is indicated by thorough depopulation of nonimmunes. Can you assist in effecting? Think can provide temporarily for Miami by river steamer accommodating 36, on which new disinfecting plant is located, if you will help out in maintenance. Think island should be patrolled by water to prevent emigration of suspects to neighboring keys and mainland. I have no boat; *Germ* sold. Will arrive at Key West to-morrow afternoon."

Assistant Surgeon McAdam reports that the tugs *Nezinscot* for Port Royal and *Potomac* for Portsmouth, N. H., left last night with most of the force from the naval station. Small launch left for Elliotts Key this morning with 6 or 7 passengers. Four schooners in the past ten days have gone to the mainland; probably only immunes on board. List of departures agrees with steamship companies lists so far as determined.

The quarantine officer at Port Royal, S. C., is informed that the tug *Nezinscot*, which left Key West last night for Port Royal with part of force from naval station, Key West, should be quarantined.

September 5: The quarantine officer at Port Royal is directed to remand the *Nezinscot* to South Atlantic quarantine.

September 3: Deputy Collector of Customs Barr is telegraphed as follows:

"Passed Assistant Surgeon Stimpson will reach Miami to-morrow. Kindly give him all assistance possible. Look out for people from Elliotts Key. Launch left Key West yesterday morning for this key with 6 or 7 passengers. They should be detained."

Deputy Collector of Customs Barr reports from Miami, Fla., that State Health

Officer Jackson is carefully watching the situation. That launch was dispatched this morning by the latter to catch passengers to Elliotts Key and that he is acting with the custom-house vigilantly.

Dr. Porter is telegraphed as follows:

"Detention camp on Mullett Key will be ready in two or three days. Possibly Tortugas might be used as detention camp. Will wire definitely concerning this later. Regarding subsistence for detention steamer at Miami, can not make expenditures except through Service officer."

Surgeon Carter is directed to wire details of boat patrol, and what vessels were in use.

September 4: Recommend Tortugas for camp for four weeks service. Put on water guard early yesterday morning, Sweating concurring. Chartered 2 launches, perfected to-day by adding a schooner. Porter asks me to continue it. [I] recommend it, and do so pending action of Bureau. Schooner with boats anchored in Man-of-War Harbor—launches in other channels—no egress without pratique. For this need navy launch and *Gamma*. *Dora* needed if available.

Surgeon Carter is informed that Tortugas would be opened as detention camp; that arrangements were being made with the Plant Line to transport equipage from Mullet direct to Tortugas for 100 people.

Assistant Surgeon Corput at Mullet Key is directed to ship by to-night's boat to Clarke at Tortugas, tentage and floors, outfits, including bedding, cooking, and dining room utensils for 100 people. Steward Peck to assist. Arrangements made with Plant Line to transfer material.

Assistant Surgeon Fricks's orders to New Orleans revoked and he is to proceed to Key West and report to McAdam.

The State health office of Florida is informed that all preparations have been made for opening Tortugas as a detention camp, which is thought sufficient for egress from Key West; that arrangements are being made for revenue cutter and navy launches; the tug *Nezinecot* can be obtained after her arrival at Port Royal, and the patrol instituted by Carter will be continued.

Acting Assistant Surgeon Sheldon is ordered to Tortugas. Passed Assistant Surgeon Smith is ordered from Hampton, Va., to Tortugas to take charge of the detention camp. Surgeon Carter reports to date (night of 4th) 28 cases and 3 deaths from yellow fever at Key West.

September 5: Surgeon Carter reports to date 50 cases and 6 deaths.

September 5: Passed Assistant Surgeon Stimpson reports a mild case of yellow fever at Miami in the person of a refugee from Key West. The case has been isolated five days, and all precautions taken against the spread of the disease.

September 6: Surgeon Carter reports to date 64 cases and 6 deaths.

Surgeon Carter is telegraphed as follows:

"Papers state Porter wired State board, Jacksonville, to direct various State quarantine officers to disinfect all vessels coming from Government quarantine stations. Wire meaning of this."

Surgeon Carter replies:

"Porter says measure taken as temporary expedient to prevent panic and distrust believed imminent at Pensacola. No distrust felt and none intended by him. He sees and agrees to this. Authorizes you to use this to health officials. Asks not to publish it."

September 7: Passed Assistant Surgeon Cumming reports the arrival of the *Nezinecot* at South Atlantic Quarantine, via Port Royal, with 21 men on board, five days out from Key West—all well. Held for disinfection. Assistant Surgeon McAdam reports to date 96 cases and 7 deaths.

September 8: Assistant Surgeon Clarke telegraphs that the detention camp at Tortugas is ready for occupation.

[From Public Health Reports of September 15, 1899.]

September 8: Passed Assistant Surgeon Smith reports his arrival with Steward Olsen at Key West, en route to Tortugas, to take charge of detention camp.

September 9: Assistant Surgeon Fricks reports his arrival at Key West. He reports to Assistant Surgeon McAdam, in charge of the marine hospital.

Surgeon Carter was directed to wire all details regarding transportation to and from Tortugas.

Surgeon Carter reports:

"Thirty-one new cases and 2 deaths. Tortugas will be a creditable camp—20 guests in now, and 13 more gone to-day. Arrangements for transportation are complete and satisfactory."

With reference to the transfer of persons to the detention camp at Tortugas, Surgeon Carter reports as follows:

"At present *Powhatan* and *Glazier*, supplemented by the tug *Bolivar*, take refugees to Tortugas. When the refugees are ready to leave, will disinfect the *Powhatan* and *Glazier*, bring the refugees in pratique in them to Plant and Miami steamers in Key West Harbor, thence to mainland. The *Bolivar* will continue two trips per week to take refugees to Tortugas. Am trying to keep all three vessels clean, but redisinfect those bringing returning refugees to avoid possible contamination en route."

Assistant Surgeon McAdam reports from Key West 23 cases, 2 deaths: 1 death at marine hospital. Twenty-four refugees sent to Tortugas yesterday.

September 11: Assistant Surgeon Trotter is directed to remain at Port Tampa as chief representative of the Service.

Assistant Surgeon McAdam reports for to-day, 12 new cases: several physicians not heard from.

Surgeon Carter reports from Key West as follows:

"Leave for New Orleans to-night. Vessels not quarantined will take by lighter only immune passengers, of whom there will be very few, and freight incapable of conveying infection, both under certification. Freight will be cigars."

Assistant Surgeon Trotter telegraphs:

"Acting Assistant Surgeon Altree reports a death from yellow fever this morning in hospital at Port Tampa City; necropsy confirms diagnosis. Five under observation, no symptoms: 3 from tug *Maria Louisa* in harbor, 2 from *Mascoite*. *Maria Louisa* remanded to Mullet Key quarantine. Body buried before report. There is a panicky feeling prevailing; exodus begun. House-to-house inspection to-day."

September 13: Assistant Surgeon Trotter reports all well in camp at Port Tampa.

Assistant Surgeon McAdam reports for Key West 35 cases, no deaths. Two guests for Tortugas to-night.

Precautions against yellow fever at Key West.

TORTUGAS, FLA., September 1, 1899.

SIR: I have the honor to append herewith copy of circular letter this day sent to the superintendents of the Union Bridge Company at this station and at Key West:

"During the prevalence of yellow fever in Key West your supply boat shall be required to observe the following restrictions:

- "1. That the crew of said boat shall not be allowed on shore in Key West.
- "2. That she shall bring no passengers other than those with certificates that they have had yellow fever. All baggage must be disinfected.
- "3. No clothing or fabrics shall be allowed to land unless disinfected."

Respectfully, yours,

TALIAFERRO CLARK,
Assistant Surgeon, U. S. M. H. S.

[From Public Health Reports of September 22, 1899.]

September 14: Assistant Surgeon McAdam reports for to-day 15 cases, 1 death.

September 15: Assistant Surgeon McAdam is authorized to charter the *Shamrock* for use.

Assistant Surgeon McAdam reports for this date 30 cases, 1 death.

September 16: Assistant Surgeon Trotter reports from Port Tampa that a house-to-house inspection of Port Tampa City and Tampa is negative, and nothing suspicious has been reported from St. Petersburg.

Assistant Surgeon McAdam reports for to day 38 cases, 1 death.

September 17: Assistant Surgeon McAdam reports for to-day 5 cases, 1 death.

Assistant Surgeon Trotter reports condition in detention camp at Port Tampa City unchanged.

September 17 and 18: Assistant Surgeon McAdam reports for the two days 54 cases and 2 deaths.

September 19: Assistant Surgeon McAdam reports to-day 31 cases and 1 death.

Passed Assistant Surgeon Smith reports admitted to detention camp at Tortugas 44 from Key West and 33 from contractor's gang at Tortugas.

September 19: Assistant Surgeon Trotter reports no change in the situation and that the camp at Port Tampa City will be closed Thursday (21st) noon, as the cases will then have been ten days under observation. All well in camp and if nothing develops the State quarantine against Port Tampa and Port Tampa City will be raised on the 21st.

[From Public Health Reports of September 29, 1899.]

In view of the allegations published in several newspapers, purporting to have emanated from official authorities of Florida, to the effect that the present epidemic of yellow fever in Key West is due to the "negligent inspection service of the Marine-Hospital Service," at Habana, and no disavowal by said authorities having been received or noted in the press, the Bureau deems it necessary to state that it knows of no evidence or facts which justify such assertions. The alleged facts and intimations, so far as known, have been thoroughly investigated and found to be without foundation.

Key West.—Assistant Surgeon McAdam reports as follows:

"September 22, 38 cases, 5 deaths; September 23, 40 cases, 3 deaths; September 24, 30 cases, 2 deaths; September 25, 26 cases. Two physicians not heard from. September 26, 47 new cases, 2 deaths; September 27, 26 new cases, 1 death. Ten passengers sent from Tortugas to Tampa to-night. September 28, 39 cases, 1 death."

Miami.—September 22: Passed Assistant Surgeon Stimpson reports another case of yellow fever at Miami.

September 25: Assistant Surgeon Von Ezdorf is ordered to Miami to report to Passed Assistant Surgeon Stimpson.

September 25: Past Assistant Surgeon Stimpson reports:

"Horsey has decided that patient is ill with yellow fever. Diagnosis has been complicated by patient having drunk a quantity of rum, and the presence of dengue. He was taken sick on morning of the 20th. * * * Guards placed around hotel, where patient is sick, 24th. Suspects isolated in another portion of the building. Porter can not come; he has telegraphed Burgess in Jacksonville to come."

The State health officer of Florida reports as follows:

"Assistant State Health Officer Horsey declares case at Miami yellow fever. All precautions taken."

September 26: The State health officer of Florida reports:

"Have instructed that suspect at Miami, with all in building, be moved to steamer *Santa Lucia*, which is the disinfecting plant, to thoroughly disinfect

premises and have daily house inspection for ten days. This is all I deem necessary or demanded at this time."

September 26: On account of the number of cases of dengue at Miami—225 from July 18 to September 26—the following telegram is sent the State health officer of Florida:

"I suggest that at Miami action be taken to prevent the spread of dengue. This can be inaugurated now with the house-to-house inspection that you have ordered. Dengue patients to be isolated and effort made to prevent their infecting their rooms by removal of all textiles daily and exposure to sun for twelve hours—each patient having one set of bedding and personal wear in use and another in the sun. Failing sunlight, disinfect. Rooms also to be sunned and aired thoroughly. This method, as you know, was successfully used by Dr. Loeber, Touro Infirmary, 1897, with actual yellow fever, and by Dr. Vickery, National Soldiers' Home, this summer, with cases of supposed dengue. Have ordered Von Ezdorf, who is an immune, to assist Stimpson, Miami, Stimpson cooperating with your health officer."

September 28: Von Ezdorf arrives.

Detention Camp, Tortugas.—September 21: Passed Assistant Surgeon Smith reports 9 refugees received to-day.

September 23: Passed Assistant Surgeon Smith reports for the week as follows:

"Refugees received, 18; released, 32; remaining, 31. September 27: 22 refugees received from Key West yesterday, and 13 released to-day."

Port Tampa City.—September 23: Assistant Surgeon Trotter reports that quarantine against Port Tampa and Port Tampa City was raised on the evening of the 23d.

September 25: Assistant Surgeon Trotter at Port Tampa City, Fla., reports as follows:

"Quarantine officer, Mullet Key, reports captain of schooner detained in quarantine, from Key West quarantine; has some symptoms of yellow fever, but diagnosis is not certain."

[From Public Health Reports of October 6, 1899.]

Key West.—Assistant Surgeon Trotter reports as follows: September 29, 54 new cases, 1 death; September 30, 22 new cases, 2 deaths; October 1, 48 new cases, 2 deaths; October 2, 32 cases, 1 death; October 3, no report; October 4, 33 cases. Eight refugees left for Tampa to-night. October 5, 43 cases, 2 deaths.

Port Tampa.—Assistant Surgeon Trotter reports as follows: October 2, State quarantine officer at Mullet Key reports that captain of schooner in quarantine died yesterday of yellow fever; remainder of crew well.

Detention Camp, Tortugas.—Passed Assistant Surgeon Smith reports, September 30, for the week: Refugees received from Key West, 22; refugees received from contractors' camp, 4; refugees released from contractors' camp, 13; refugees remaining in contractors' camp, 44; October 3, 8 refugees released for Tampa yesterday; missed steamer on account of bad weather; will lie on boat at Key West until to-morrow night.

The following letter and telegram from Surg. H. R. Carter indicate very clearly the widespread and considerable duration of the disease in Key West upon his arrival at that point.

[Telegram.]

KEY WEST, FLA., September 3, 1899.

WYMAN, Washington, D. C.

Fever well scattered. Two to four weeks' duration or longer. Can not be suppressed. Principal hotel, resort of drummers, infected. Chance of mainland

being already contaminated considerable. Fever mild. Boat patrol put on for Key West. Sent bridge gang to Birdkey, Tortugas. Navy tugs gone.

CARTER.

[Informal letter from Surgeon Carter on the situation in Key West.]

KEY WEST, FLA., *September 4, 1899.*

DEAR DR. WYMAN: The fever here is past control. Indeed, it is well nigh epidemic. Mild, very mild, probably severer than that in New Orleans last year, but less so than that of 1897. The only ill people I have seen have been under extremely bad sanitary surroundings. It may be well to utilize it to immunize some men. It should be without mortality for young men.

Its origin is unknown; ascribed to mail, especially a lot from dead-letter office, Habana. Also to goods (clothing) under false bottom of trunk. Have heard little or no evidence for either.

The worst features are the very considerable time it has lasted. Certainly three weeks, and I would not be surprised if five were as near the mark, and the fact that the principal hotel in Key West is now well infected and has had a case of fever in it since the 25th. This is where all drummers stop. Fortunately, there have been but few of them recently. If the 25th was the date of the first case in the hotel, the risk is not so great, as we have only from (about) the 28th to fear this hotel. Whether it has already reached the mainland is a question. Dr. Porter tells me that all who went to Tampa, found by the Plant Line lists, have been located and are under observation. In addition to wiring you the list of people who had left, which was delayed by closure of cable office, this list was given him, and Miami and other places to which these people had gone notified directly. One man left sick (don't know it was fever) for Eustis, and 1 who was convalescent—I judge from the fever—went to Bartow with, of course, disinfected baggage. Both places notified. If it be not already on shore, it should not get there. This place is easy to guard. No guard had been put on until after I arrived. Sweeting considered he had no authority. Still, I think only one vessel went away with passengers (7) to Elliotts Key. I wired Miami and judge they are safe. I put on the water guard, after consulting with S.; two launches at first, and now a schooner has been added. Dr. Porter asks that we (the Service) continue this and I do so pending your action. Will put it in charge of McAdam. It is for this we want the Navy launch and (if she will stay in repair) the *Gamma*. The *Gamma's* engine, I think, is worn out and she can not be depended on for more than seven or thirty days' work between overhauling. Still seven days may save us. If a cutter be available, it would be very well; but the difficulties of coal, water, etc., are considerable. The place to guard is Key West; not the Florida coast.

Very respectfully,

H. R. CARTER.

P. S.—The water guard is now, I judge, efficient. McAdam inspects the vessels as to sanitary condition, after certification of crew and passengers by Florida board, and disinfection of baggage, and visés this certificate. On this they pass the guard boats. Three vessels stopped yesterday.

I think there is no question about the use of Tortugas if the other departments do not interfere. From what I know of Mullet Key I do not believe it possible to use it for women and children if the mosquitoes were as I saw them. It would produce death in same, I think, in a considerable number. A detention is not and should not be an infected place, and the laborers would run no risks. There is need for hurry, however, if it is to be used, and more medical officers are needed. It will be hard to get provisions and hard to administer, but no trouble to guard. If need be, discontinue it for vessels for the present; very few have been there recently.

Very respectfully,

H. R. CARTER.

The following telegram from Assistant Surgeon McAdam is further evidence that the disease existed for some weeks before it was discovered. This is further shown by the report of Dr. Plummer, city health officer, Key West, forwarded to the Bureau, in which it appears that 54 cases of yellow fever were reported to him as health officer up to and including September 2, 4 being reported from August 24 to August 29, and 50 reported from August 29 to September 2, inclusive.

[Telegram.]

KEY WEST, FLA., *September 7, 1899.*

WYMAN, *Washington:*

Ninety-six cases reported to this evening. One death to-day. Cuban physician reports 18 cases dengue; several doctors not heard from.

MCADAM.

The following is a report of Assistant Surgeon McAdam, previously alluded to, and memoranda and letters, fragmentary in nature, but published as furnishing valuable information on the subject. These memoranda and letters were found in his effects and forwarded by Surgeon Murray.

REPORT OF ASSISTANT SURGEON MCADAM ON THE SITUATION IN KEY WEST,
AND MEASURES TAKEN.

KEY WEST, FLA., *September 30, 1899.*

SIR: In compliance with Bureau letter of September 25, 1899, requesting a written report on the yellow-fever situation here, and the measures taken for its suppression, I have the honor to make the following report:

The fever is very widely scattered through the city, being prevalent among the wealthy and in the better parts of the town, as well as among the less-favored classes living in the more crowded and dirty districts. This condition has prevailed since the outset. At the time of the announcement of yellow fever it was thought wise to place guards and take precautions against its spread, but as soon as a superficial canvass of the town could be made, the infection was found to be so general that all idea of limiting it was abandoned. On the evening of September 1, the day after the first cases were reported, after visiting a few cases of the so called dengue, Dr. Sweeting pointed out 9 distinct foci where he had found yellow fever, and the inference was that these constituted but a small part of the whole number in town.

On the morning of September 4 all guards were removed, and since that time no attempt has been made to isolate yellow fever, all efforts being directed to confining the disease to the island and getting rid of the nonimmunes.

It was at first estimated that there were about 1,500 nonimmunes in the city, exclusive of children. Of these, in the neighborhood of 500 have left, the majority going North by the Mallory boats; the rest through the Tortugas detention camp.

Since the last epidemic there have been about 6,000 children born.

Seven hundred and sixty-six cases have been reported to date, with 36 deaths, giving a mortality of about 4.7 per cent. This, however, is too high, as a great many persons have had the fever without a physician being called, and have therefore not been reported, and a large number treated by the Cuban physicians have been reported as cases of dengue.

A large majority of the patients are treated at their homes or boarding houses, but a good number have been looked after in the municipal hospital. This was

opened with the object of taking care of the destitute, but any person has been admitted who has so desired.

In a few instances, among the better class of people, disinfection of the rooms in which sickness occurred has been attempted by fumigation with formaldehyde, but in no case has an attempt been made to disinfect the whole house. There has been nothing done in the way of disinfecting the dwellings of the poor. In general the houses are so open and poorly constructed that the only method applicable would be a thorough washing down with bichloride solution.

The climatic and sanitary conditions present favor its spread. The temperature is high, there are daily showers, and the hot sun is unshaded for the greater part of the day. Dependence is placed on surface drainage, and this is rendered particularly inefficient by the blocked-up condition of the gutters. On every street there are numerous puddles of stagnant water containing refuse material.

Considering the abundance of susceptible material present, the very general exposure to infection, and the conditions favoring the propagation of the poison, the prospect for a speedy termination of the epidemic is not encouraging.

An important measure for preventing the extension of the disease to the mainland is the water patrol established and maintained by the Service as an aid to State authorities. No vessel of any sort is allowed to pass the patrol without a permit from the State health officer. The most dangerous of these, from a quarantine standpoint, are possibly the small sailing craft.

Some of these boats come from the various inhabited keys, bringing wood, charcoal, salt fish, etc., and returning with provisions, Key West being their market. A large number are permitted to leave for fishing and sponging cruises extending over periods of several weeks. When so specified on the permit, these are inspected before departure by an officer of the Marine-Hospital Service, with the object of limiting the amount of dunnage carried, and excluding any person or baggage not allowed by the permit. The dunnage in these boats has not been subject to disinfection, though the attention of the State health officer has been called to the possibility of its proving dangerous.

Respectfully, yours,

W. R. MCADAM,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

MEMORANDA AND LETTERS FOUND IN THE EFFECTS OF ASSISTANT SURGEON M'ADAM.

Notes on yellow fever at Key West.

KEY WEST, *August 31, 1899.*

For the past two or three weeks there have been a number of cases of fever, accompanied by pains in back, head, and limbs, and, in a few, catarrhal symptoms, scattered through the city. To-day Dr. Charles Sweeting announced to Drs. McClanahan and Marcour, of the Navy, and myself that he had in his private practice discovered two cases of yellow fever. One of these, a Mr. Browder, has been sick for six days at Hotel Key West; the other, Mr. Eagen, has been ill for five days at the residence of Mr. Knight, corner of Duval and Fleming streets. At 7.30 this evening Eagen died. His remains were allowed to stay in the house overnight. The house and inmates were quarantined and guards placed to enforce isolation.

A Mr. Oakley was taken sick last night, the 30th, with chill, fever, pains in back and limbs. He was moved from his room on second floor of Hotel Key West, south side, to a room near Mr. Browder's, on the same floor, north side.

A guard was placed in corridor of second floor to prevent communication with north end of house, and all guests except these two moved to other quarters. Secured list of passengers leaving Key West to-night on steamship *Cocoa* for Habana.

September 1.—Dr. McClanahan, assistant surgeon of the Navy, was taken sick early this morning with above-named symptoms. The hotel and inmates were placed in quarantine and guards placed to prevent egress or ingress.

The funeral of Mr. Eagen took place this morning at 9 o'clock. I have been informed from reliable sources that fourteen loaded carriages attended the remains to cemetery.

This morning Dr. Sweeting informed me that he had been informed to the effect that quarantine had been declared against Key West by the mainland, and that the agents of the steamship lines touching here were notified to sell no tickets or take no passengers from this port.

Henry Evans, colored, a native of Georgia, from Tampa, having been in Key West since June 24, 1899, was taken ill on July 2, 1899, at his home, 616 Whitehead street, with severe headache, high fever, pain in the back. He was ill for five days and so weak that he could not work for about a week after illness. He was not treated by any physician. After his recovery two children in same house were taken sick with similar symptoms. Name of mother, Eliza Mickens.

BARTOW, FLA., *September 30, 1899.*

DEAR SIR: Yours of the 25th received, and in reply will say, I discovered on the morning of the 17th I had a very high fever, with severe headache. My kidneys hurt me very much. I had Drs. Fogarty and Maloney with me. I was in bed seven days. I left Key West on the 26th and was not able to do much work for some time afterwards. I was in Key West six days before I was taken sick.

I am a traveling salesman: was at Tampa, St. Petersburg, and country towns the week before, but was not with any sick person. I guess I had the yellow fever. If so, I would like to have immune papers, as they would probably keep me out of a quarantine camp occasionally.

Your doctors at Key West are satisfied I had it. I would be thankful for the papers.

Yours, truly,

S. A. EDWARDS.

Dr. W. R. MCADAM. *Key West.*

P. S.—When I was taken sick I had a room at Mrs. Babcock's, and was taken there.

S. A. E.

Browder states that on the morning of the 24th he first felt indisposed. After forcing himself to rise and take some breakfast, he went to his office and attempted to carry on his regular work, but passed the greater part of the morning dozing in his chair.

After dinner he was troubled with chilly sensations and in the evening took to his bed. He took a dose of calomel at night, and the following morning a dose of quinine. He stated that while Mr. Edwards was sick he visited him daily. Mr. S. A. Edwards was taken sick about 8 a. m. (on August 17, 1899), first complaining that he had fever. He went to bed and stayed there for two days. On third day he got up, went to drug store and to dinner, and in the evening had a recurrence of his illness. During the attack his stomach was irritable. See Dr. Fogarty about his symptoms. Sick eight days.

He came from Babcock's boarding house to the hotel.

Browder states that he first opened suspected trunk on 15th of August, and the same day, he thinks, counted cigarettes found in it; but this count may have been made on 16th. He did not come in contact with the trunk afterwards.

Dates of attack: Dr. Browder, August 24; Dennis L. Eagen, August 25—died August 31; Oakley, August 31, morning; McClanahan, September 1; King, September 2; Mrs. Ludlow, August 31, afternoon; McDonald, September 3; Cosgrove boy, August 22—died August 30—address, Whitehead street, between Catherine and Eaton.

On August 12 Carlos Burgos, age 10 years, died. He was officially reported as a case of cerebro-spinal meningitis. The history of his illness as gathered from the friends and family is as follows:

Saturday, August 5, the child was as well as usual, running and playing about in the sun bareheaded. On Sunday he was taken sick with pain in the head and increasing high fever and great restlessness. His friends believed him suffering with sunstroke. He vomited several times at the onset of the trouble.

The attending physician made a diagnosis of typhoid fever. After two or three days there was a lull in the disease, followed by an aggravation of the symptoms, with spells of screaming. Wednesday there were streaks of blood in vomited material.

On Friday, August 11, he was seen by Dr. Sweeting in consultation and the friends were warned to avoid contact with the sufferer as much as possible. Death occurred on Saturday, August 12, 1899.

On Friday and Saturday vomiting of black material occurred, and after death marked yellow discoloration developed. Dr. Maloney stated that before death petechial spots appeared over the body. The physicians advised immediate burial.

Prior to the attack a mission school was for a few days being held in the Burgos house, the students being the four belonging to the home and three or four outsiders.

A Miss Pierce, daughter of pilot, visited the house while child was sick. Shortly afterwards two of the Pierce children were laid up with a fever and were treated by their father.

Carlos Burgos was born in Key West and spent all his life either here or in Tampa.

The grandson of Captain Cosgrove, light-house tender *Laurel*, was taken sick at the home of his grandparents on Whitehead street, between Catherine and Caton streets, on August 22, 1899, and died eight days after, or on August 30 at 11.30 p. m.

This case was one of the two cases on which the announcement of yellow fever was based by Dr. Charles Sweeting, and which were reported by him as yellow-fever cases on the 31st of August.

The history of the case as far as is known is as follows:

The child was taken suddenly sick with high fever. The attending physician did not take temperature. After several days child became unconscious, passed dark-colored material from bowels, and vomited dark-colored material. After death the yellow discoloration of the skin became very pronounced. Dr. Sweeting states that it was very intense when body was seen by him on morning of the 31st.

Mr. John Capot, employed at Furguson's livery stable, and living at 310 Southard street, makes the following statement:

He was born in St. Augustine, Fla., and lived there till six years ago. About four months ago he came to Key West. He never had had yellow fever. About the 24th of August, while working at the stable, he was taken sick with pain in back and limbs, and a severe headache—no chill. In the afternoon he had a high fever and some nausea. The fever continued high, and on the second day he vomited several times, and suffered intensely with a heavy feeling—a lump he calls it—in

the stomach. He became delirious. While he was out of his head he was moved from his home to Mrs. White's, and stayed there till he recovered. During convalescence he noticed, and all his friends remarked, the yellow discoloration of his skin. His illness lasted thirteen days, and he was greatly prostrated by the attack. He was treated by Dr. Fogarty. Shortly after his recovery a small boy of Mrs. White's, after sleeping in the bed which Capot had occupied, was taken sick, and all of the White family were in succession taken down. They were treated by Dr. Harris for yellow fever.

Post-mortem.

Jesus Sanchos, aged, — years: died 4 a. m. September —, 1899. Autopsy at 9 a. m.

Sugillation marked in dependent portions of body; bleeding from nose and mouth. Thorax: pleura bile-stained, dry; lungs do not retract; old pleuritic adhesions deeply congested; tubercular nodules in apices; on section, tissue oozes dark blood: lung tissue friable. Pericardium: infected and stained yellow; about 40 c.c. fluid, yellowish in color. Heart: abnormal in size: contracted auricles show marked congestion at margins: contains little blood; valves competent. Spleen: normal in size and color. Kidneys: enlarged, pale; stillate veins marked: capsules strips easily: on section, cortex is thickened and shows fatty changes. Gall bladder about one-half filled with thin bile. Liver: size about normal; light dun color: some slight mottling: on section, is dry: tissue friable. Stomach: highly congested; vessels engorged; contains about 1 pint dark, thin blood; mucous membrane shows extensive patches of ecchymosis, and numerous points of capillary hemorrhage: the fine, red clots adherent to bleeding points are in some cases 2 mm. long; mucous membrane swollen, soft, and friable: duodenum shows advanced inflammation of mucous lining: same changes as in stomach: contains blood, dark and somewhat thick: ileum shows patches of subperitoneal ecchymoses: on section, shows patches of inflammation and contains material resembling black vomit. Bladder contains about 2 ounces of urine.

KEY WEST, FLA., *September 2, 1899.*

DEAR DOCTOR: I regret to report to you the occurrence of ten cases of yellow fever in our city, viz:

Mr. Pate, Eaton below Duval (dead); Mr. Morris, Caroline, below Simonton, fourth day; Mr. Stockin, Caroline, below Simonton, fourth day; Max Rosenthal, Duval, below Peteonia, fourth day; Mr. Bains, O'Brien House, fourth day; Mr. Oakley, Hotel Key West, third day; Jules Hubert, over Duffy's store, third day; Mr. Taylor, at Gullion House; Mr. Schoenfeld, at Walhouskis, third day; Mr. Cochran, Gee's house, Galveston alley.

I have also to report six cases of suspects: Mrs. Sewall, Eaton street above William street; Mr. Sturgeon, Eaton street, above William street; Mr. Traluck, John White residence; Mr. D. Rosenthal, Duval, near Peteonia street; Captain Shottuck, Gullion House; Mrs. Daley, Whitehead, above Southard.

Yours, respectfully,

J. N. FOGARTY, *M. D.*

Dr. J. W. V. R. PLUMMER, *City Health Officer.*

CONCERNING ONE ALLEGED METHOD OF THE INTRODUCTION OF THE FEVER.

Relative to the statements that yellow fever was introduced into Key West from a certain trunk with false bottom, the following

correspondence is of interest, and shows the trunk, including the false bottom, was disinfected before leaving Habana:

KEY WEST, FLA., *September 12, 1899.*

SIR: Surgeon Carter requested me to ask if you have any record of the disinfection of a trunk belonging to a man named Alfonso ——. It was stamped on the 12th of August, arrived here on the 14th, and was opened by an inspector, who developed yellow fever on the 24th.

Respectfully, yours,

W. R. MCADAM,

Assistant Surgeon, M. H. S.

P. A. Surg. M. J. ROSENAU,

U. S. Marine-Hospital Service, Habana, Cuba.

[First indorsement.]

OFFICE OF MEDICAL OFFICER IN COMMAND, M. H. S.,

Habana, Cuba, September 13, 1899.

Respectfully referred to Asst. Surg. Carl Ramus, U. S. M. H. S., for a full report on this subject; this paper to be returned.

M. J. ROSENAU,

Passed Assistant Surgeon, U. S. M. H. S.

[Second indorsement.]

BARGE PROTECTOR,

Habana, Cuba, September 16, 1899.

Respectfully returned to Passed Assistant Surgeon Rosenau with the following report August 12, 1899, two trunks and their contents, belonging to one Benito Alonso, were disinfected on the *Protector* and delivered the same day on board the steamship *Olivette*. It was observed that both trunks contained false bottoms several inches above the real bottoms, so that a casual glance at the apparently empty trunks revealed the probable existence of false compartments, even though the false bottoms were nailed down and covered with the lining paper of the trunks. When portions of the false bottoms were removed, the spaces below were seen to be filled with packages of cigarettes. The contents of the trunks (above the false bottoms) consisted of ordinary baggage similar to that usually found in most other trunks. The disinfection process employed was as follows:

All fabrics were disinfected by thirty minutes' exposure to steam at 212° to 220° F. under pressure. Materials injured by steam disinfection (rubber, leather, etc.) were sprinkled with formalin, as were also the interior of the trunks. The packages of cigarettes were well sprinkled with formalin through the openings made by us in the false bottoms.

CARL RAMUS,

Assistant Surgeon, M. H. S.

TORTUGAS DETENTION CAMP.

On account of the presence of yellow fever in Key West, Fla., it became necessary to establish a detention camp for the egress of persons desiring to leave Key West. Accordingly on September 4 orders were issued for the transportation of tents and equipage from Mullet

Key, near Port Tampa, to Tortugas, 60 miles from Key West, as shown by the following:

[Telegram.]

WASHINGTON, September 4, 1899.

CORPUS, *Mullet Key, via Port Tampa, Fla.:*

Ship to Clark, Tortugas, by to-night's boat, tentage and floors, outfits, including bedding, cooking and eating utensils for 100 people. Put Steward Peck at this work. Arrangements made here with Plant Line.

WYMAN.

On September 4, also, P. A. Surg. A. C. Smith was ordered to proceed to Tortugas to assume charge of this detention camp. Before the arrival of Passed Assistant Surgeon Smith the medical officer in command of the quarantine station, Asst. Surg. Taliaferro Clark, had already so far arranged for the reception of guests that it was possible to immediately admit 25 persons into the camp. Surgeon Carter was the Service representative in Key West.

There was at the time of the establishment of the camp on Tortugas a gang of mechanics and laborers doing certain construction work for the Navy Department at that point and having restricted intercourse with Key West, and soon after the camp was opened it became apparent that yellow fever existed among this gang of laborers. This was, however, eradicated by the strenuous efforts of the medical officers before mentioned.

I append hereto a letter from Surgeon Carter explaining the measures taken to prepare for the reception of people in this camp, and letters from Passed Assistant Surgeon Smith showing the peculiar difficulties encountered, and the final report of Dr. Smith on the camp and its management.

[From Surgeon Carter on arrangements for detention camp.]

KEY WEST, FLA., September 9, 1899.

SIR: There was a little delay caused by failure to receive the telegram to be transmitted to Clark directing the opening of the camp, which was not transmitted as the operator at Tortugas was off duty from sickness, and hence could not be received. Twenty-four hours' delay was thus caused.

Twenty bridge-gang men went down Sunday and were quarantined at Bird Key. One of them got sick on Thursday, and, on my arrival, the remainder were transferred to the casemates at Fort Jefferson. Twelve went down to Tortugas yesterday and some more will go to-night.

At present the *Glazier* and the *Powhatan*, in tow or separately, take the passengers down when it is time to discharge them. These vessels will be disinfected and bring back those who are in pratique and land them aboard the Plant or Miami steamers anchored in the harbor here, and the *Bolivar*, a large tug now chartered by the Union Bridge Company, will take the refugees from Key West to Tortugas. She will run two trips per week and we will bear one-half the expense, \$250 or \$350 per week. The aim, of course, is to bring the people who have passed their quarantine back in a perfectly clean vessel. Of course we will try, and are trying, to keep the *Glazier* and *Powhatan* clean now, and I think the chance of their

getting infected is slight; still, we will disinfect them before we begin to carry those who have finished their quarantine.

The camp will be a credit to us, I think, but will not be large. Nearly all who have money to go anywhere, have gone to New York and only a small number of nonimmunes remain, with money enough to go to the mainland.

I am to blame, if there be blame, in allowing people from Key West to go to Habana Harbor for direct transfer to the Ward Line. Unquestionably there is risk that these people may sicken en route to New York and quarantine the vessel. The same risk is taken by the vessel, however, in a decidedly less degree, with her Habana passengers, their number partly making up for their less degree of exposure to infection. The Ward Line, Rosenan writes me, declines to take them save under conditions which do not apply to them. Had he wired, it would have been received Thursday and no one been permitted to go last night. Am sorry he did not. As I wrote you, I do not see the reason why passengers and freight should not come from Habana to Key West, nor why immunes should not go from Key West to Habana or Tampa. The boats do not come to the wharf, and the guard boats can prevent communication.

About the origin of the fever nothing is known. I hear an attempt will be made to ascribe it to a trunk of clothing from Habana infecting Broader and Egan. Broader was the first case recognized. I am engaged now in trying to find the early cases, which antedate, I am sure, those of these two men. Broader sickened on the 24th ultimo and Egan about a day later, yet on the 30th we find about sixteen cases, i. e., an epidemic, from three to five weeks old. I think it will not be difficult to get at cases before these. I want to say that Clark deserves credit, much credit, for the promptness and good judgment he shows in the somewhat difficult problem Tortugas now presents.

Very respectfully,

H. R. CARTER,

Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[From Passed Assistant Surgeon Smith, transmitting diagram showing detention camp, etc.]

TORTUGAS QUARANTINE STATION, *October 7, 1899.*

SIR: As directed in Bureau letter of the 27th ultimo, I have the honor to transmit herewith a rough diagram of this fort and island, showing the location of the various people occupying the place and the guard line dividing the detention camp from the rest, and showing also the places where cases of yellow fever were taken from among the Union Bridge Company's men.

As to sanitary restrictions, quarantine for the entire island has been maintained against Key West since September, but it is quite likely infected material had got into the contractor's camp before that time, or it is possible that it has been smuggled in since.

Respectfully, yours,

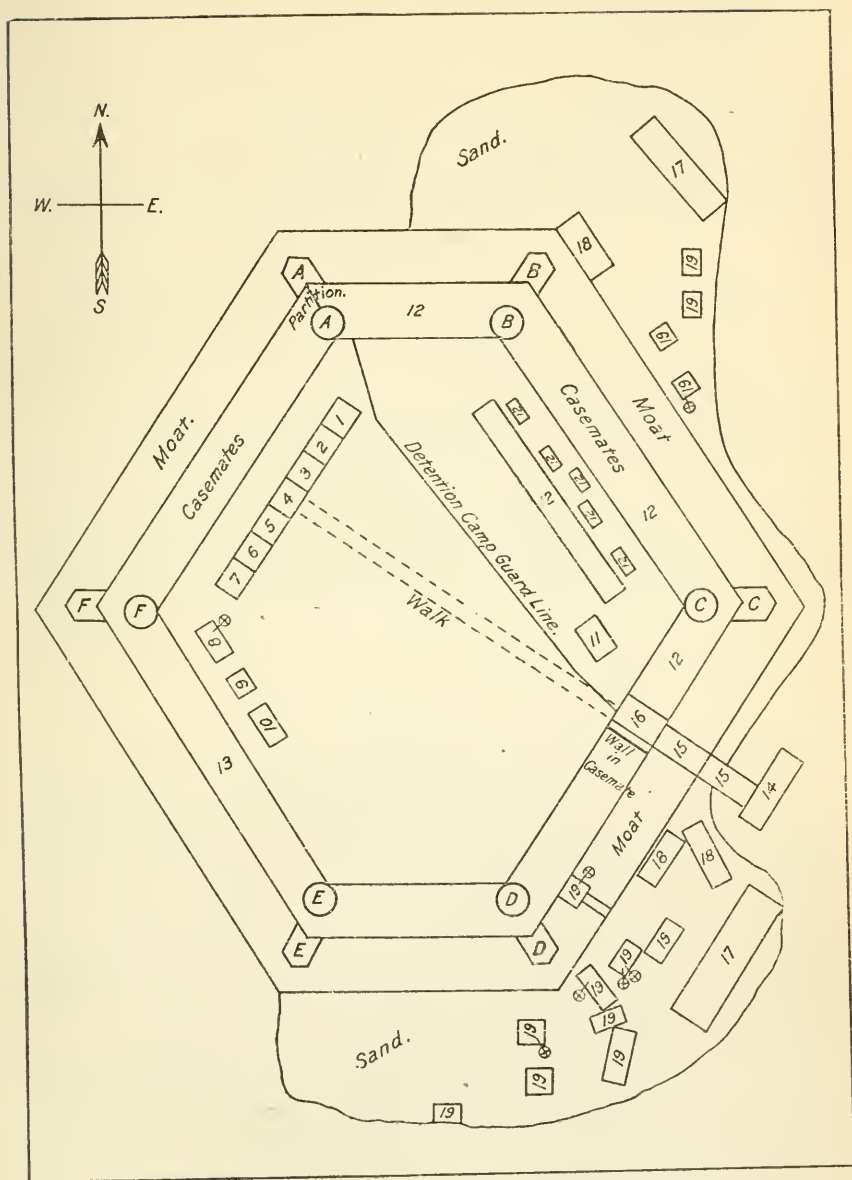
A. C. SMITH,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure No 1.]

MAP OF GARDEN KEY, TORTUGAS.



[Inclosure No. 2.]

EXPLANATION OF MAP.

- 1, 4, 5, 6. Quarantine station quarters.
2. Superintendent of construction, United States Navy.
3. Manager for Union Bridge Company, contractor.
7. Sergeant's office.

8. Telegraph office and operator's residence, in which two outside workmen also live.
9. Employee of bridge company, residence.
10. Sergeant's residence.
11. Light-house keeper's residence; light-house in Bastion C.
12. Detention camp.
13. Casemates where suspects are isolated.
14. Disinfecting and landing wharf.
15. Bridge over moat.
16. Sally port.
17. Coal sheds in building.
18. Machine houses of bridge company.
19. Camp of bridge company's laborers.
- A, B, C, D, E, F. Bastions.

⊕ indicates where cases of yellow fever have been found in residents of the island outside of the detention camp.

[From Passed Assistant Surgeon Smith on the infection of the contractor's camp.]

TORTUGAS QUARANTINE STATION, *October 8, 1899.*

DEAR DR. WYMAN: Your personal letter of September 27, on the subject of the yellow fever in the contractor's camp here, was received by last mail. It is likely the camp became infected before the quarantine was put on against Key West, September 1, or fomites may have been smuggled in afterwards. At all events, a little epidemic got started, and I am still worrying for fear it may not be stopped.

* * * * *

You can not imagine the difficulties under which Dr. Clark has to conduct his station as a regular thing on account of these outside people, and they have caused no end of trouble to the detention camp.

Very truly, yours,

A. C. SMITH.

Surgeon-General WYMAN,

United States Marine-Hospital Service.

[From Passed Assistant Surgeon Smith—further regarding infection of contractor's camp.]

TORTUGAS QUARANTINE STATION, *October 10, 1899.*

SIR: I have the honor to say that in my previous letters on the subject of the yellow fever in the Union Bridge Company's camp on this island it may be that I have not shown sufficiently well the chief sources of danger to that camp, and I add a few words on the subject herewith:

Previous to the announcement of the epidemic in Key West Assistant Surgeon Clark had maintained a quarantine of the camp in favor of that city, giving a guarantee of health as to persons and vessels going from here there and allowing communication under these circumstances.

On and after September 1 this was reversed and no communication was allowed with Key West, except on the part of the crews of the vessels which have to go there for supplies. All articles brought from the city were passed through Dr. Clark's hands and disinfected, or passed according to sanitary rule, and persons having to come to the island were disinfected as to baggage and clothing and held under observation.

However, the contractor's steamer, *Ambrosio Bolivar*, had to make about two trips a week to the city, and in the intervals was often used for hauling sand from a nearby key, and it was impracticable to disinfect her after each trip. Two of the crew were left in Key West with yellow fever, and the vessel was disinfected on her return, September 9. She was disinfected again October 1; and this morning another of the crew, who was ashore in Key West several days up to October 5,

was found with yellow fever and removed to Bird Key, and the vessel is undergoing a third disinfection.

When it is taken into consideration, moreover, that men like the contractor's laborers here tend to do all they can to defeat quarantine rules, to smuggle in contraband goods if possible to do so, and to conceal mild attacks of fever in order to prevent being sent to an isolation hospital, it is easy to see how hard it has been to protect the contractor's camp.

I make this extended explanation for the reason that if the matter should ever be taken up from an outside point it is probable an effort would be made to show that the fever on the island might have originated from the detention camp, although this would be disproved by the fact that the detention camp has remained uninfected and that the only cases of fever found in it have been in persons who had lately been admitted either from Key West or from the contractor's camp.

Respectfully, yours,

A. C. SMITH,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Final report on Tortugas Detention Camp, by P. A. Surg. A. C. Smith.]

TORTUGAS DETENTION CAMP, *November 6, 1899.*

SIR: Garden Key, Tortugas, on which is situated, among other things, the Tortugas Quarantine Station, was the only spot within reach of Key West where a habitable refugee detention camp could be established quickly and at small cost when yellow fever was declared present in Key West the last day of August, this year. It was a beautiful spot for a detention camp except for a few reasons, and it served well the purpose for which it was selected, since only a few of the non-immune inhabitants of Key West showed a disposition to leave their city during the epidemic.

The Key is covered by Fort Jefferson, an old-fashioned, well-built brick fort, with deep casemates and with a moat and moat wall extending around it, against which, on the outside, two small patches of sand with a connecting beach have been built up by the wash of the tides. Outside and directly in front of the sally port stands the disinfecting wharf, and on the patches of coral sand strong iron coal sheds are being built for the Navy Department. Inside the fort a number of buildings are strung along the front of the casemates, two large barrack buildings, one furnishing quarters for the persons of the quarantine station, and the other for the most part empty before the detention camp was established, and several small buildings used as residences and for other purposes by the various people stationed on the Key. The empty barracks and the adjoining casemates, with four one-story, small brick buildings lying between, furnished the accommodations for the detention camp. The upper rooms and casemates were used for sleeping apartments, the lower rooms for office, dining rooms, and store rooms, and the small buildings and lower casemates for kitchen and laundry purposes and storage.

The principal objection to Fort Jefferson for a detention camp was the fact that it was occupied beforehand, and one element of the community was a great embarrassment and a source of danger from a sanitary standpoint. The fort and island were already occupied by the quarantine station, an ordnance sergeant of the War Department, a light-house keeper, a superintendent of improvements of the Navy Department, and a large force of contractor's (Union Bridge Company) men working on the coal sheds. There were thus several families living in the fort, besides large numbers of laborers and other workmen in and about it. Another disadvantage of the situation was the fact that the only market—and a

poor one at that—Key West, was nearly 60 miles away, and while that city was the only gate of communication with the outside world it was itself the center of the yellow-fever infection.

The permanent detention camp site of the Service for this region is on one of the keys at the mouth of Tampa Bay, but this was not used on account of the impossibility of protecting guests from the frightful pest of mosquitos which exists there; and Surg. H. R. Carter, who was at Key West, recommended Tortugas. This recommendation was made and adopted September 1, and camp equipage was shipped direct from Mullet Key to Tortugas by a Plant Line steamer. By an accident Asst. Surg. Taliaferro Clark, who was in command at Tortugas, was not informed until September 6. He then set about preparing the vacant part of the fort before described and announced the camp ready to receive refugees September 8, Surgeon Carter having meanwhile employed the necessary attendants and guards at Key West. The first refugees, 13 in number, left the night of the 8th and arrived at camp the morning of the 9th. The following night 16 more departed for Tortugas. I arrived the morning of the 10th and assumed command of the camp.

The yellow fever hospital of the Tortugas quarantine, consisting of two very small wooden buildings connected together, is on Bird Key, a little bunch of coral sand rising out of the reefs a mile away from Garden Key and the fort. This was quickly put into use, for cases of yellow fever began to arise immediately among the refugees and a fresh supply was never lacking as long as people were received from Key West. Acting Assistant Surgeon Sheldon, who was employed and sent to Tortugas specially on account of the detention camp, was put in charge of this hospital. Assistant Surgeon Clark, besides carrying on the work of the maritime quarantine as usual, took charge of all the disinfection connected with the handling of the refugees and inspected the health of the contractor's camp. Acting Assistant Surgeon Hagen, who was already at the station as Dr. Clark's assistant, helped in various parts of the work, both in the detention camp and in the maritime quarantine. Hospital Steward E. T. Olsen, who arrived September 10, acted as steward for the detention camp. No commissary, quartermaster, or bugler was employed. No fences were set up to divide the detention camp from other parts of the fort, but a guard line was drawn for the purpose from the sallyport to one of the bastions, and two armed guards patrolled this line constantly. The refugees were kept within this boundary, and when, late in September, there was reason to fear that the contractor's camp might have become infected with the fever from Key West, the guarding of this line was made very strict. There was no very suitable place for the isolation of suspects, those who were taken sick, but whom I did not feel justified in sending straight to the yellow fever hospital. The casemates opposite the detention camp and outside of it were used for the purpose.

There was communication with Key West through the quarantine station's vessels, the steamer *Powhatan* and the schooner *W. C. W. Glazier*, and through the steamer *Ambrosio Bolivar*, attached to the contractor's camp. Refugees were brought from the city at first on all these vessels. When it became necessary to take away the released refugees the *Powhatan* was disinfected and was used alone for that purpose. It was found impossible to have any set days for the running of these boats. The *Glazier* usually went back and forth in tow of the *Powhatan*, and the latter boat ran on such days as it was necessary to send refugees away to meet at Key West the steamers carrying passengers to Tampa or Miami or Habana.

The routine of ordinary detention-camp work was broken into late in September by certain things which came to pass in the contractor's camp on the island. This camp was mainly located outside the fort walls, but a number of persons connected with it lived inside, and the limits of the entire key were so narrow that

divisions of the permanent island community were not of great value. On September 10 a case of indeterminate fever arose in this camp. It ran a brief course without distinctive symptoms, the patient being isolated in the casemates. September 19, a young man who had been admitted to the detention camp from the contractor's camp seven days before was taken sick with fever. His case remained undecided until the 26th, when sufficiently clear symptoms of yellow fever appeared, and he was transferred from the suspect hospital in the casemates to Bird Key. September 28, or the preceding night, a foreman of laborers in the contractor's force, a young man living with the telegraph operator inside the fort, was taken sick with symptoms of yellow fever. Complete facts were wired to the Bureau on the occurrence of this case, and I wired Assistant Surgeon McAdam, at Key West, to suspend issuing permits to refugees, and that no more would be received for the present.

The telegraph operator's house was disinfected on the 28th, and the following day the contractor's camp was overhauled, and all bedding and clothing steamed, and sleeping quarters washed thoroughly with bichloride solution. The contractor's steamer, *Ambrosio Bolivar*, was also thoroughly disinfected.

I was hopeful that the infection had not become widespread, and that the disinfection would check any epidemic in the contractor's camp. It was desirable not to close the detention camp suddenly and without publishing warning in Key West, if this could be avoided, and when a few days had elapsed after the disinfection without any new mishaps among the contractor's men word was given to Assistant Surgeon McAdam that further opportunity was offered refugees to come to the camp. A few refugees were received from Key West October 6. Meanwhile, on October 2, two more cases of yellow fever were discovered in the contractor's camp, another October 3, and a suspicious case October 4, but all these could be traced to the infection existing before the disinfection was done September 29. After this there were no more cases until October 12, and it was supposed the disease had been suppressed, but on the last-named date three cases suddenly appeared among the contractor's negro laborers, and another on the morning of the 13th. On the 13th and 14th, accordingly, another and exceptionally thorough disinfection of the contractor's camp was done, being carried so far as the tearing down and burning of the shanties occupied by the colored laborers, among whom these last cases arose. On the 15th another case of fever was discovered, and on the 16th two; one arose on the 18th, and one on the 19th. The last cases were all in colored men, and were all traceable to the infection which showed itself so active just before the disinfection of October 13 and 14. The case of October 19 was the last.

The patient taken sick on the 18th was the office messenger of the detention camp, who was sometimes sent with messages to the part of the island occupied by the contractor's camp and became exposed in that way. He was the only one not of the contractor's force.

It is impossible to trace the source of infection of the Union Bridge Company's camp at Tortugas, but it was undoubtedly through the company's steamer, the *Ambrosio Bolivar*, which usually made two trips a week to Key West to bring supplies from that city, taking no precautions to avoid infection there, and was at other times used in the company's work at the island. The vessel was disinfected several times at the quarantine station, but it was impracticable to do it every trip. Assistant Surgeon Clark put on quarantine against Key West September 1, but this could not have been made absolutely effective without stopping the contractor's work at the island entirely.

All cases of yellow fever occurring in the contractor's camp were removed to the isolation hospital belonging to the quarantine station and detention camp and were cared for there.

The refugees that came from Key West October 6 were the last received from

that place, although the camp was open to them a considerable time thereafter. Through delays caused by slow recovery from fever in some of the refugees, and through one long delay caused by very stormy weather in October, the final lot of refugees was not sent away until the last of October. After that the work of the camp was practically at an end. The privileges of the detention camp were opened to the contractor's men on the island, and they availed themselves of them in almost as large numbers as the people of Key West.

The number of refugees received was 143, of whom 83 were received on account of Key West and 60 on account of the contractor's camp, in the latter number being included 21 who came from Key West to work at Tortugas and had to be isolated and kept under observation the regulation period to protect the health of the station and island.

Twenty cases of yellow fever were treated from the detention camp and the contractor's camp together, besides a few doubtful cases. It is gratifying to record that there were no deaths, although some of the cases were severe.

I write this report in advance of having received orders to close the camp, since the work of the camp is practically ended and I have already received orders to proceed to other duties.

Respectfully, yours,

A. C. SMITH,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

YELLOW FEVER AT MIAMI, FLA., FALL OF 1899.

When the yellow fever was announced at Key West on August 31, in addition to the vessel patrol around the island of Key West and the establishment of a means of exit therefrom through a detention camp at Tortugas, it was deemed essential to immediately send inspectors to the two points in Florida having the closest commercial relations with Key West, namely, Port Tampa (Mullet Key quarantine) on the west coast and Miami on the east coast. The object of these assignments was not only that the Bureau might be accurately informed, but also to render assistance should the fever appear in these places and to see that the Treasury Interstate Regulations were enforced. Accordingly on September 1 P. A. Surg. W. G. Stimpson was detached from his duty in connection with the epidemic of yellow fever at the National Soldiers' Home near Hampton, Va., and ordered to Miami, where later he was reenforced by Asst. Surg. R. H. von Ezdorf, an immune to yellow fever; and still later by Asst. Surg. L. D. Fricks, who had been at Key West. Still later, because of the dispute of the diagnosis, Surg. R. D. Murray was sent to Miami. A mild case of yellow fever was reported at Miami by Passed Assistant Surgeon Stimpson on September 5, the person being a refugee named Anderson from Key West. Dr. Stimpson reported that all necessary precautions had been taken in this case. He further reported that a mild fever had been prevailing for some time and was still prevailing, diagnosed dengue, and from his later report it will be seen that this fever prevailed to a considerable extent throughout July, August, and September. However, after September 5 no case of yellow fever was reported until September 22, this case being in the person of a man named Har-

grove, whose infection could not be traced to its source. An attempt was made to attribute the infection to his visit to a cattle vessel called the *Laura*, which had come to Miami from Nuevitas, Cuba, where, in the performance of his duty as quarantine officer, Asst. Surg. T. F. Richardson contracted yellow fever and recovered. But Dr. Richardson did not have the yellow fever until eight days after the departure of the *Laura* and his was the only case at Nuevitas during the year.

The *Laura* left Nuevitas, after disinfection, on September 8 for Miami. September 13 the steamship *Maria Herrera*, from Habana, arrived at Nuevitas, and Dr. Richardson personally supervised the disinfection of suspected baggage from Habana, and three days later, namely, September 16, was seized with yellow fever.

The *Laura* arrived at Miami, and was discharged from quarantine September 13, and it was then that Hargrove was said to have visited the vessel and received the infection. His disease developed September 20. The impossibility of Dr. Richardson's case infecting the steamer *Laura* is shown by the above statements, for the *Laura* had left Nuevitas eight days before Dr. Richardson was taken sick.

It is more than likely, therefore, that the infection at Miami is attributable to some connection with Key West, and that, too, before the cordon of noncommunication had been established around Key West.

September 22 the Bureau received the following telegram from Dr. Stimpson at Miami:

One case of yellow fever here placed under guard awaiting J. L. Horsey's arrival from Jacksonville. Urine contains albumen. Has been sick three days.

On September 26 Dr. Stimpson wired with regard to the same patient that he had died at 11 o'clock that day; that he had made every effort to ascertain where the patient had been exposed to infection, but could learn nothing definite, and that the patient had been visited by a number of persons since he was taken sick on the 22d. The same date (September 26) the Bureau received a telegram from State Health Officer Porter, as follows:

Have instructed that suspect at Miami with all in the building be moved to steamer *Santa Lucia*, which is the disinfecting plant; to thoroughly disinfect premises and have daily house inspection for ten days. This is all I deem necessary or demand at this time.

On September 27 the following was received from Past Assistant Surgeon Stimpson:

Have ascertained there have been many cases of dengue here with slow pulse; in some cases rising temperature with falling pulse; a few cases with slight jaundice of eyes and face. One case had gastritis; slight jaundice of eyes and face; pulse, 78; temperature, 102; much prostration; no rash; urine examined eighth day, no albumen; diagnosis made by attending physician, dengue, complicated by drinking. Did not report case. Saw man this morning. Convalescent but still has slight discoloration of conjunctivæ. All suspects moved from hotel this morning.

On September 26 Dr. Stimpson wired there had been 225 cases of dengue at Miami between July 18 and September 26. Bearing in mind the close relation which this disease has always had with yellow fever, the difficulty of differentiating between mild cases of the two diseases, and the good results which experience had shown follow from aëration of houses, bedding, and personal effects, I wired the State health officer advising this course as reasonable and proper even though it were claimed there were no yellow-fever cases among the cases of fever called dengue. This State health officer, who was at that time in Key West, replied, acknowledging the receipt of my telegram and stating that he would call the matter to the attention of his assistant at Miami. In his report of October 13, Dr. Stimpson states that a little of this work had been done, but imperfectly, and between September 22 and October 24, at which last date yellow fever was pronounced epidemic, the time was largely occupied in examination of cases, many of which in the opinion of the two marine-hospital officers, were deemed suspicious and some of them declared to be yellow fever. The reasons for these opinions are set forth in the letters from Passed Assistant Surgeon Stimson and Assistant Surgeon von Ezdorf which follow.

It would seem that in localities liable to infection by yellow fever when epidemics of dengue occur, some of which excite a suspicion of being yellow fever, it would be the part of wisdom to treat these cases as though they were yellow fever, following the same rule that should be observed with regard to all epidemic diseases—namely, to give the benefit of the doubt to the side of safety and treat the suspected cases as infectious. The frank expression of a doubt, accompanied with a declaration of intention to be upon the safe side, and the adoption of measures avowedly to suppress the dengue, if it be dengue, would doubtless aid in the prevention of the spread of yellow fever, and such measures should, under these circumstances, be enforced.

October 19 seven cases and one death were reported. Measures were taken at first locally with regard to the infected houses, and on October 24 nineteen cases of yellow fever were officially reported by the State health officer, and broader measures were at once put into effect. The city of Miami was quarantined; a detention camp was established and named Camp McAdam, after the young assistant surgeon who had lost his life but a short time before during the yellow fever epidemic in Key West. After the establishment of this camp apprehension was felt that persons from Miami were escaping the precautionary detention required and going to Jacksonville. Reports on these matters are included in the following pages, together with a report upon the establishment and management of Camp McAdam. The camp itself was under the immediate command of Passed Assistant Surgeon Stimpson, who was transferred from Miami for this duty, his place at Miami being filled by Asst. Surg. L. D.

Fricks. Dr. Stimpson had, to assist him in charge of the camp, Assistant Surgeon von Ezdorf and others. The number of yellow fever cases reported at Miami during the season were one hundred and thirty-three, with ten deaths. Two hundred and seventeen persons passed their period of detention at Camp McAdam. The management of these camps is always a trying duty, and it is a pleasure to call attention to the resolution of thanks for courteous and efficient management passed by the guests, from among whom five cases of yellow fever were removed.

CHRONOLOGICAL SUMMARY AS PUBLISHED WEEKLY IN THE PUBLIC HEALTH REPORTS.

Following are extracts from the Public Health Reports published weekly and giving a daily narration of events with regard to Miami as they transpired:

YELLOW FEVER AT MIAMI, FLA.

[From Public Health Reports of September 8, 1899.]

Miami.—September 2: P. A. Surg. W. G. Stimpson has been ordered from Old Point to Miami to represent the Service on the east coast of Florida. The State health officer of Florida telegraphs as follows:

“Detention camps for nonimmunes from Key West at Tampa Bay and Miami wanted and will be appreciated. From advices judge infection is very general over Key West and proper method to check and stamp out is indicated by thorough depopulation of nonimmunes. Can you assist in effecting? Think can provide temporarily for Miami by river steamer accommodating thirty-six, on which new disinfecting plant is located, if you will help out in maintenance. Think island should be patrolled by water to prevent emigration of suspects to neighboring keys and mainland. I have no boat; *Germ* sold. Will arrive Key West to-morrow afternoon.”

September 3: Deputy Collector of Customs Barr, at Miami, is telegraphed as follows:

“Passed Assistant Surgeon Stimpson will reach Miami to-morrow. Kindly give him all assistance possible. Look out for people from Elliotts Key. Launch left Key West yesterday morning for this key with six or seven passengers. They should be detained.”

Deputy Collector of Customs Barr reports from Miami, Fla., that State Health Officer Jackson is carefully watching the situation: that launch was dispatched this morning by the latter to catch passengers to Elliotts Key, and that he is acting with the custom-house vigilantly.

Dr. Porter is telegraphed as follows:

“Detention camp on Mullet Key will be ready in two or three days. Possibly Tortugas might be used as detention camp. Will wire definitely concerning this later. Regarding subsistence for detention steamer at Miami, can not make expenditures except through Service officer.”

September 5: Passed Assistant Surgeon Stimpson reports a mild case of yellow fever at Miami in the person of a refugee from Key West. The case has been isolated five days and all precautions taken against the spread of the disease.”

[From Public Health Reports of September 29, 1899.]

Miami.—September 22: Passed Assistant Surgeon Stimpson reports another case of yellow fever at Miami.

September 25: Assistant Surgeon von Ezdorf is ordered to Miami to report to Passed Assistant Surgeon Stimpson.

Passed Assistant Surgeon Stimpson reports:

"Horsey has decided that patient is ill with yellow fever. Diagnosis has been complicated by patient having drunk a quantity of rum, and the presence of dengue. He was taken sick on morning of the 20th. * * * Guards placed around hotel (where patient is sick). 24th: Suspects isolated in another portion of the building. Porter can not come. He has telegraphed Burgess, in Jacksonville, to come."

The State health officer of Florida reports as follows:

"Assistant State Health Officer Horsey declares case at Miami yellow fever. All precautions taken."

September 26: The State health officer of Florida reports.

"Have instructed that suspect at Miami, with ail in building, be moved to steamer *Santa Lucia*, which is the disinfecting plant, to thoroughly disinfect premises, and have daily house inspection for ten days. This is all I deem necessary or demanded at this time."

September 26: On account of the number of cases of dengue at Miami—225 from July 18 to September 26—the following telegram was sent to the State health officer of Florida:

"I suggest that at Miami action be taken to prevent the spread of dengue. This can be inaugurated now with the house-to-house inspection that you have ordered. Dengue patients to be isolated and effort made to prevent their infecting their rooms by removal of all textiles daily and exposure to sun for twelve hours, each patient having one set of bedding and personal wear in use and another in the sun. Failing sunlight, disinfect. Rooms also to be sunned and aired thoroughly. This method, as you know, was successfully used by Dr. Loeber, Tonro Infirmary, 1897, with actual yellow fever, and by Dr. Vickery, National Soldiers' Home, this summer, with cases of supposed dengue. Have ordered von Ezdorf, who is an immune, to assist Stimpson, Miami. Stimpson cooperating with your health officer."

September 28: Von Ezdorf arrives.

[From Public Health Reports of October 27, 1899.]

Miami.—October 19: Seven cases, one death.

October 23: Eleven cases.

Establishment of a detention camp at Fulford for Miami.

* October 24: Passed Assistant Surgeon Stimpson telegraphs that the State health officer reports 19 cases of yellow fever at Miami, and that he requests the establishment of a detention camp at 10 miles distance, to be under the control of the Marine-Hospital Service and large enough to hold seventy-five refugees.

October 25: Passed Assistant Surgeon Stimpson is telegraphed authority to establish a camp at Fulford, and that the camp outfit has been ordered forward.

[From Public Health Reports of November 3, 1899.]

Miami.—October 25: One case, no deaths. Steward Peck is ordered to report to Passed Assistant Surgeon Stimpson, at Miami, for duty.

October 26: Five cases.

October 27: Seven cases.

October 28: P. A. Surg. T. B. Perry ordered to Titusville, Fla., to act as purchasing agent for the detention camp under command of Passed Assistant Surgeon Stimpson.

October 30: Assistant Surgeon von Ezdorf reports seven cases, no deaths, yesterday. To-day, five cases, two deaths. Camp at Fulford will be opened Thursday.

October 31: Two cases, no deaths. Passed Assistant Surgeon Stimpson reports that forty guests will go to the detention camp to-morrow.

November 1: Eight cases.

November 2: Two new cases of fever. Passed Assistant Surgeon Perry reports his arrival at Titusville, Fla.

[From Public Health Reports of November 10, 1899.]

Miami.—Detention camp for Miami located at Fulford, 10 miles distant, and named Camp McAdam, after Assistant Surgeon McAdam, who died of yellow fever in Key West October 12.

November 3: Passed Assistant Surgeon Stimpson reports that one hundred persons are in camp, including employees and officers—forty-four refugees; eight arrived to-day. One case of yellow fever found among them and taken immediately to hospital.

November 4: He reports seven refugees received in camp and seven new cases of fever in Miami yesterday.

November 6: Assistant Surgeon Fricks is relieved from duty at Key West and ordered to report to Passed Assistant Surgeon Stimpson, at Miami, for duty.

[From Public Health Reports of December 1, 1899.]

Miami.—November 24: Passed Assistant Surgeon Stimpson reports as follows:

"Von Ezdorf has completed the disinfection of the hospital and has moved to camp. Health Officer Porter raises quarantine from Key West to-day, baggage and household goods to be disinfected before shipment."

REPORT FROM PASSED ASSISTANT SURGEON STIMPSON ON THE PREVAILING FEVER AT MIAMI AND ITS ALLEGED SOURCE.

MIAMI, FLA., *October 1, 1899.*

SIR: I received your letter yesterday, and asked Dr. Jackson, agent of the State board of health, about the beginning of the epidemic of so-called dengue here. He said that he diagnosed his first case on July 18, and he would not like to say that this fever was here before that, as he has no records prior to that date. There is very little doubt, however, that the fever was here before that time, probably a few days or weeks. He has kept a complete temperature and pulse chart of nearly all his cases, and he has shown these to Dr. Von Ezdorf and myself. The first of these charts shows a fever with a temperature high at first and declining irregularly without remission, the pulse ranging from 100 to 120 on first day and gradually falling, in many cases falling when the temperature has risen. In these first cases the pulse was not especially slow.

As soon as I received your letter I asked Dr. Jackson to let me make a copy of his charts, and he said he had sent them to Dr. Porter the night before, but as soon as they were returned I could have copies. All the cases with jaundice I have been able to trace were taken sick after August 14. I hope, however, to find someone who was seriously sick before this time, and will then get a history from the patient and physician. If there should be yellow fever here now, I think there will be very little difficulty in tracing it back beyond August 14.

The patient that died had an undoubted attack of yellow fever, black vomit, and all other characteristic symptoms. I asked Dr. Horsey to allow me to have an autopsy, but he refused, as he said this was unnecessary, as the patient had had black vomit. Dr. Jackson also asked him to have an autopsy, but he would not permit it.

Dr. Horsey has informed Dr. von Ezdorf in my presence that if he comes to the conclusion there is yellow fever here he (Horsey) will go to Key West and relieve Dr. Porter, who will come here, but that Dr. Porter will not discuss yellow fever with anyone except Murray or someone of his experience. Dr. von Ezdorf requests me to tell you he has never seen dengue, and if Porter or Horsey finds this out they may discredit any diagnosis he may make.

Dr. Horsey has maintained all along that Horgroove, the man who died from yellow fever, did not get his infection from the cattle boat *Laura*, from Nuevitas. He heard yesterday, however, for the first time that Richardson had yellow fever. So he says now that Horgroove probably contracted the disease by going on board this boat. This vessel arrived here August 29; left September 1 for Nuevitas, from which place she sailed September 8, and arrived here September 11. She had a certificate of disinfection from Richardson and a clean bill of health. She was mechanically clean, indeed one of the cleanest vessels I have ever seen, and she showed evidence of thorough disinfection, sulphur was still to be smelt in the hold, and blankets and clothes were still wrinkled. Dr. Horsey passed the vessel without disinfection, after a detention of two days, to make five days from her time of leaving, and she came to the wharf September 13.

Dr. Porter had directed that all vessels disinfected by officers of the Marine-Hospital Service shall be redisinfectd, but Dr. Horsey admitted her without redisinfection on account of her good sanitary condition. There have been many reports about Horgroove having visited this ship, and I have investigated every one and found each one, except the following, to be without foundation. Horgroove was on the boat only once, and that was at 11 o'clock on the morning of the 15th, just before the boat's departure. He drove to the wharf in a carriage, taking a large water bottle with him. He remained on the boat a short time and then returned to the hotel with his bottle filled with liquor. He brought nothing else off this vessel except five cigars. A number of the employees, white and black, of the wharf were on the vessel during the daytime, but none of them have been sick. From these facts you can readily see that Horgroove could not possibly have become infected by this boat.

Dr. von Ezdorf thinks the epidemic here is similar to the one at Galveston, Tex., in 1897, as reported in the early months of that year. He says he believes the fever here to be a mild form of yellow fever, but he can not get enough symptoms to make a positive diagnosis. He is getting histories from patients and convalescents. He has obtained a chart of Miami and requested Dr. Jackson to mark on it the location of all the "dengue" cases he has had this summer of which he has a record. Dr. Jackson said he would do this when he had time.

Respectfully,

WM. G. STIMPSON.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT FROM ASSISTANT SURGEON VON EZDORF ON THE PREVAILING FEVER AT MIAMI.

MIAMI, FLA., October 2, 1899.

SIR: I have the honor to make the following preliminary report of the prevailing fever in Miami, Fla.

I met Dr. Jackson, the representative of the State board of health here, also assistant State Health Officer Horsey and examined some of the records kept by these officers. They report that there have been 235 cases of "dengue" with no deaths. One case of yellow fever in a man from Key West recovered; one case of yellow fever died September 26. The source of infection of the later can not be traced. I suggested that probably a mild form of yellow fever is mixed up with their "dengue" and

that this man was one of their typical cases and that the disease may have gone about unrecognized. This was positively denied.

As to the character of this prevailing, the doctors tell me that a case may begin with a chill taken at night (!), early morning (!), and sometimes in the day, followed by headache, backache, pains in the "joints and bones;" have temperature between 100 and 104; pulse ranging between 75 or 80 to 120. Face may be flushed; sometimes not. Illness of two to five days; may have relapse (!). Urinary analysis made daily in all cases showed no albumen. Eruption occurred in some cases; in some not; this of a mealy character on legs, chest and arms, face or neck. Some of these marked; others transient.

In convalescence some patients complained; others not. Some were very weak (!); others not. Some had great appetite (!); others not. Some might have slight yellow eyes (!); others not. This yellow eye explained in that it is common in this climate, and that we might have it in dengue. Some had suppression of urine! There are at present two patients reported convalescent from "dengue"—one child reported with the disease and one young man in seventh day of a fever.

I am somewhat suspicious of this fever being yellow fever for the following reasons: The patient attacked would have a chill at night or early morning, followed by headache, backache, and "pains all over" (this the patients say), some nausea on the second day, and even vomiting, fever, and free perspiration, some suppression of urine. This is the history I have obtained in a general run; obtained from cases who have convalesced. So far the temperatures have been high at the beginning and declined rapidly. My further suspicion was attracted in these patients recovering from the fever were extremely weak!; did not complain of pains and aches; then, too, everyone seems to be hungry; also that convalescence is rapid. One further suspicion is that there have been patients who have had a relapse, not a distinct second attack.

It is reported that one immune of Memphis epidemic has had an attack of this fever. In the two patients I have seen I noted the lack of noncorrelation of pulse and temperature and no albumen in the urine, and no one symptom of yellow fever marked, except, possibly, the tenderness over pit of stomach and suppression of urine. There was, besides, vomiting of only a bilious character; no report of any black stools on or after the third day. Some cases have had slight yellow cast of eyes, and two convalescents are reported to have had a slight yellowness of skin of face!

Regarding the diagnosis of "dengue," I have seen three cases shown me to have an eruption.

I can not make out an eruption. I did not see an eruption, but saw some broad, diffuse redness, one on abdomen in woman, where her corsets would strike her, the other two in men, over anterior surface of forearms. On pinching the skin over this eruption so-called I found a paling, which remained white for nearly one second, showing faulty circulation of skin, as may be seen in yellow fever.

This same skin symptom I found on other parts of the body. The doctors report pains in "the joints and bones," but all those I have seen report "aching all over." No throat observations were made, and a stiffness of the muscles or eruption or mottling of the throat has not been noticed.

In my opinion it looks more like an extremely mild type of yellow fever, and I think if it is a more typical case will yet be seen as weather gets cooler, but at present I can not make a positive diagnosis.

In looking over some temperature records I came upon one which looked like a yellow-fever chart. I dwelt some time on the history of this case—one J. J. Holly. Dr. Horsey said yes. He had looked upon the case with suspicion too; had visited the case twice daily; had made two examinations of the urine daily for the first five days and once a day thereafter until case was well. Had this case shown albumen I would call it a case of yellow fever. The case had a relapse, judging

from the chart, but not a distinct intermission between the two attacks. The first day there was a slight temperature rise and a fall of pulse. The temperature declined gradually, and on the morning of fifth day was normal; man wanted a gallon of milk; took some, and that evening temperature rose again, and from this on showed curve of an arch, what I believe was the relapse.

I wished to get a copy of the chart, but this was sent away to Dr. Porter the same evening of the day I saw it. I had a talk with the man and submit a statement he made. I also send some charts I obtained from Dr. Jackson.

Respectfully, yours,

R. H. VON EZBÖRF,
Assistant Surgeon, M. H. S.

SURGEON GENERAL MARINE-HOSPITAL SERVICE.
(Through P. A. Surg. W. G. Stimpson.)

[Inclosure 1.]

Statement of J. J. Holly—October 1, 1899.

Was taken 9 p. m., chilly sensations from feet to head, followed by backache, then headache, then full of pains, then fever. Had highly colored urine which smelled strongly. Nausea for two days, no vomiting. Pains lasted forty-eight hours, still suffered considerably for four days. Gums bled a little. Had no taste twelve days after getting well, really haven't taste back now, which is the nineteenth day. Can't chew tobacco, but can now smoke a cigar.

Very weak after getting well. Some backache, some soreness in legs. Felt like had been beaten from hips down. Appetite poor for two weeks after illness.

(The above statements were made to one question: How did you complain?)

Examination October 1.—Ears pale. Gums pale and hard. Is constipated. Eyes show pale-yellow cast. Mr. Holly said further: "Some one described an attack of yellow fever they had and my sickness was exactly like it step by step."

[Inclosure 2.]

Voluntary statement of Mr. Prout, made October 1, 1899, regarding a man in his employ who stayed in his house.

Mr. Sanders was taken sick 11 p. m., Saturday, September 16, 1899, came home, said, "I am sick, had chill," went to bed. Next morning had a high fever, in afternoon eyes were unusually brilliant. On Monday, cheeks flushed, became yellow like a Chinaman about face, began with his eyes. (I stopped my wife from going to his room to bring him food, said Mr. Prout, as I was afraid.)

Tuesday, had a fever. Wednesday, less fever. Thursday, Friday, and Saturday, improving. Friday, Sanders was so weak he couldn't stand up. Sunday, could be up. Monday, moved out of the house. Is very hungry, and Mr. Prout said "he could eat enough for ten men."

Was extremely weak after his attack and very hungry. No rash noticed. His skin was continually moist during his whole illness. Light hurts his eyes. He had pains all over.

Mr. Prout's wife was taken sick 10 p. m., September 25. Is very tender over stomach; weak and very hungry; had pains in legs

Mr. Prout was sick with constipation three days; ached all over in joints, neck, hips, and back; headache: not in bed. Continued two days.

Just before Sanders was sick, had another man taken with the same fever, step for step. Had seven employees who had taken sick, but lighter fever cases.

LETTER FROM ASSISTANT SURGEON VON EZDORF REPORTING HE HAD URGED
AERATION, ETC., AS DIRECTED BY BUREAU.MIAMI, FLA., *October 1, 1899.*

SIR: I have the honor to acknowledge receipt of Bureau letter of September 25, 1899, and in reply will state that I have urged upon health officials to practice the measures mentioned in your letter of sunning and airing all textile fabrics for the prevention of the spread of disease. I described fully the methods employed recently at the Soldiers' Home at Hampton, Va.

I suggested that all the doctors be told to notify their patients to air and sun all fabrics, particularly bedding, and also that inspectors be instructed to notify the people likewise, and that this should be done in particular in house where disease has occurred. I also advised that a report of this work of airing and sunning be submitted daily by the house-to-house inspectors, making this part of the work much like the inspection work done at New Orleans in January and February of this year. I was told this would be done. The weather is unfavorable for a long and continuous airing and sunning, as rains occur here every two or three hours. Under these circumstances I urged the use of bichloride—that bichloride be supplied these people so that all fabrics could be dipped in this solution before washing. This has not been done.

I urged that this work of airing and sunning or disinfection be done especially by the poorer classes, among whom fever has been most prevalent, since these people did the washing of clothes of the better classes, and that, by taking these precautions, "dengu" would not be introduced or spread among the better classes generally. I also suggested that visiting be stopped.

Respectfully, yours,

R. H. VON EZDORF,

Assistant Surgeon, M. H. S.

SURGEON GENERAL MARINE-HOSPITAL SERVICE.

(Through P. A. Surg. W. G. Stimpson.)

(Telegram.)

*Diagnosis of yellow fever.*MIAMI, FLA., *October 4, 1899.*Surgeon-General WYMAN, *Washington, D. C.:*

Von Ezdorf has seen one case. His diagnosis is yellow fever. Patient 4 miles from Miami: taken sick one day after leaving Miami. Urine contains 20 per cent. albumen. Jaundice of face and eyes; great prostration; has had nausea and vomiting. Sick seven days. The new case can not be traced to foci already located. Horsey thinks that the patient has typhoid. Von Ezdorf thinks that the patient near hotel Miami ill with mild yellow fever; Horsey says malarial fever; Stimpson agrees with von Ezdorf.

STIMPSON.

REPORT OF PAST ASSISTANT SURGEON STIMPSON ON THE ALLEGED INFECTION
THROUGH THE STEAMSHIP LAURA FROM NUEVITAS, CUBA.MIAMI, FLA., *October 10, 1899.*

SIR: I have the honor to submit the following report relative to the statement made by Assistant State Health Officer Horsey that the recent case of yellow fever at Miami, a man named Hargroove, was exposed to infection probably through steamship *Laura* which arrived here from Nuevitas, September 13, as directed by Bureau letter of October 2, 1899.

The cattle boat *Laura* left Nuevitas September 8 and arrived here September 11. She had previously made one trip between this city and Nuevitas, returning here August 29. She had a bill of health and a certificate of disinfection signed by Assistant Surgeon Richardson, M. H. S. The bill of health stated that there was no yellow fever in Nuevitas and the certificate of disinfection stated that the vessel had been disinfected in accordance with the rules and regulations of the Treasury Department. I would send a copy of these papers, but they have been sent to the custom-house in Key West.

The *Laura* is a vessel of 158 tons, with her engine and machinery in her after portion. She had been previously used as a lighter in Galveston, Tex. She carried a crew of 11 men, some of whom had never had yellow fever nor lived in Cuba. The vessel was very clean—one of the cleanest vessels I have ever seen—and the odor of sulphur was still perceptible in her hold. The captain stated that the vessel had been fumigated with sulphur and washed down throughout with a bichloride solution. The bedding and clothing of himself and crew had been placed in a chamber and steamed. Some of the blankets and clothes were still wrinkled from the action of the steam.

Dr. Horsey had received orders from Dr. Porter to redisinfect every vessel disinfected by the Marine-Hospital Service, but Dr. Horsey decided not to redisinfect this vessel, as she was so clean and showed such unmistakable signs of a thorough disinfection. The vessel was held two days, so that five days should elapse from the time of her departure from Cuba. Everyone being well, and no one having shown any signs of illness, the vessel was released September 13 and came to the wharf in Miami. She left this city at midday September 15. While here she was visited by many persons, and her chief engineer, a man by the name of Wallace, slept on shore at the Bay View Hotel with Mr. Brown, a telegraph operator. None of these persons have been sick, although none have ever had yellow fever. Mr. Wallace carried a valise containing toilet articles, etc., ashore to the Bay View Hotel, but no one in the hotel has been sick.

There have been many reports about Hargroove having visited this ship a number of times, and I have investigated every one of them and found each one except the following to be without foundation: Hargroove was on the boat only once, and that was during the afternoon of September 14. He drove down to the wharf in a carriage, taking a large water bottle with him. He remained on the boat five minutes, and then returned to the Miami Hotel with his bottle filled with liquor. He brought nothing else off this vessel except five cigars. From this you can readily see that Hargroove could not possibly have become infected by this boat.

STATEMENTS OF PERSONS INTERVIEWED.

Mr. Brown, telegraph operator, says Wallace, engineer of *Laura*, slept with him (Brown) two nights in Bay View Hotel. Wallace took a valise with him to hotel. He (Brown) was on *Laura* several times; has not been sick; never had yellow fever; did not see Hargroove on *Laura*.

Mr. Frieberg, keeper of company store, says he was on *Laura* a number of times and spent much time in engineer's room. A number of persons (Whitnell, Miller, Mitchell, Brown, etc.) were on this vessel, but none of them have been sick. He never had yellow fever; did not see Hargroove on board, and has not been sick.

Mr. Mitchell, employee Florida East Coast Railroad Company, says he was on *Laura* loading coal and cattle; has not been sick; never had yellow fever; did not see Hargroove on *Laura*.

Mr. Miller, employee Florida East Coast Railroad Company, says he was on *Laura* loading coal and cattle; has not been sick; never had yellow fever. He saw Hargroove drive down on the wharf and go on the *Laura*. Hargroove remained on the *Laura* a short time and then drove back up town. He doesn't remember the day on which this occurred.

Mr. Armetage, night watchman on dock, says Hargroove did not come on the wharf at any time during the night while the *Laura* was in port.

Proprietor of Hotel Miami says he saw Hargroove early part of the afternoon of September 14. Hargroove told him he had started to the wharf but returned before he reached there on account of rain. Later he saw Hargroove at supper. He told him he had been on the *Laura*.

Mr. Sackelberry, friend of Hargroove, says that Hargroove took a large water bottle with him to the *Laura* and brought it back full of liquor (Spanish gin). He doesn't remember on what day Hargroove went to the vessel. He brought nothing else off the vessel but five cigars. He attended Hargroove's dancing class at 8 o'clock p. m. Hargroove was there and remained until 10.30 p. m. He further says Hargroove was a man of good habits and retired early. He was a moderate drinker and rarely took a glass except just before his meals. He gave most of the liquor from the *Laura* to his friends.

Jeff ———, driver, says he drove Hargroove to wharf on the afternoon of September 14. Hargroove went on board the *Laura*, "but did not stay on boat over five minutes." He then drove Hargroove back to Miami Hotel.

Mrs. F., guest of Miami Hotel, says she saw the liquor in the water bottle in the Miami Hotel on the night of September 14.

Respectfully, yours.

WM. G. STIMPSON,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

CLINICAL REPORT OF A CASE DIAGNOSED AS YELLOW FEVER BY ASSISTANT
SURGEON VON EZDORF.

MIAMI, FLA., *October 12, 1899.*

SIR: I have the honor to forward herewith a clinical history of the case diagnosed by Passed Assistant Surgeon Stimpson and myself as yellow fever.

W. H. Austin, age, 30; white; male; has been a resident of this county one and one-half years, but has been residing in Miami one month just previous to this sickness. He walked out into the country 4 miles on Wednesday, September 27, 1899. The week previous to this Wednesday patient gives history of not having much appetite, but felt perfectly well and worked. On Wednesday, September 27, he walked 4 miles in a drizzling rain and became chilled—just as anyone would when getting wet. Said he felt all right. The man was taken sick in a shack on Thursday night at midnight or a little after—that is, early Friday morning, September 29. Patient was taken with a chill, followed by fever and nausea. Had "pains all over," but not in joints; no backache. Seen by Passed Assistant Surgeon Stimpson and Dr. Jackson at 3 p. m. Patient had a clear, injected eye, headache, constipated. Temperature, 102 F.

Was given calomel, compound cathartic pills, and compound acetanilid tablets by Dr. Jackson. At night (Friday) commenced to have vomiting, bitter. Urine showed no albumen.

September 30, Saturday, second day: Urine no albumen: vomited "off and on" "slimy light-yellow greasy-colored material," so described by attendant: did not sleep much; had four movements of bowels (result of medicine.)

October 1, Sunday, third day: Had two movements of bowels (result of medicine); did not sleep; no test of urine made.

October 2, Monday, fourth day: No test of urine made; had two movements of bowels; no sleep; has hicough.

October 3, Tuesday, fifth day (first seen by me on this day): Urine of this 7 a. m. showed 20 per cent albumen by volume. I saw the patient on the afternoon of this day; it was raining and dark and difficult to see the patient. Patient's

eyes were yellow; mind clear; was quite weak. Temperature, 102 F.; pulse, 88. Pulse was weak; skin moist; tongue coated, red at tip and borders. Has occasional hiccough when attempting to raise head; hiccoughed twice while I saw him.

October 4, Wednesday, sixth day: Urine shows about the same amount of albumen as yesterday—20 per cent. Temperature (noon), 100.4 F.; pulse, 80. Icterus of skin of face, chest, and eyes. The icterus is lighter yellow over breast than face; no yellowness of legs nor abdomen, but some of shoulder and arms. Passes urine three or four times in a day (of twenty-four hours), about three-fourths to one teacupful each time. Feels extremely weak; is greatly prostrated. Has tenderness over epigastric region just below ensiform appendix. No splenic enlargement; no distention of abdomen—on the contrary, is quite flat and hollow. Tongue coated at back, red on tip and borders; tip of tongue clearing. Feels too weak to get up, but wants to get up to get away from shack. Has never been delirious. Has not slept, except a few short naps last night with short dreams. Hiccoughs occasionally when raising head.

October 5, Thursday, seventh day: Thirteen per cent albumen in urine. Temperature (noon), 100; pulse, 80. Yellowness increasing, so that he has yellowness of a Chinaman over abdomen; yellowness is darker over chest and still darker over neck and arms. Eyes yellow as lemon. Tongue feels quite dry, but is slightly moist. No tremor. Legs still remain white and have natural color.

October 6, Friday, eighth day: Not seen; no test of urine.

October 7, Saturday, ninth day: Could not get a specimen of urine. Saw a stool, result of calomel. This stool was formed, brown streaked with black; has also a speck of red (this latter from piles); mouth and tongue moist. Temperature (4 p. m.), 99.5; pulse, 68; eyes bright, but sclera and conjunctiva yellow.

October 8, Sunday, tenth day: About same; no test of urine.

October 9, Monday, eleventh day: No albumen in urine; no bile. Temperature (11.30 a. m.), 98.4 F.; pulse, 62. Yellow skin, color of Chinaman, over abdomen; lemon yellow of eye; abdomen quite hollow, flat; has appetite, but afraid to eat; urinates more freely. Saw stool which had black mucus, black as tar, mixed with yellow mucus; no odor to stool. The stool was soft, not formed. Patient prostrated, but can stand on feet. Reported evening temperature, 98.8; pulse, 70.

October 10, Tuesday, twelfth day: No albumen in urine; 4 p. m., temperature, 98.3; pulse, 62. Pulse good; tension fair; eyes and skin still yellow; legs white; gums still deeply red at edge. Patient can now walk to door of shack. A. m. temperature reported as 98; pulse, 62. The patient is not a smoker. Patient has been improving since Saturday. The patient's mind has always been clear, never delirious.

Diagnosed from typhoid I brought out the following points: Patient was never delirious, headache not continuous; failing appetite was not gradual; no history of malaise; abdomen showed absolutely no tendency to meteorism and was flat; could about feel the backbone; no tenderness in right iliac fossa; no rose spots; eyes were bright and sclera yellow; patient did not have an apathetic, listless appearance; no muscular tremor; skin was never hot and dry, always moist; stools were soft at first, but this due to C. C. pills and calomel. I have never seen typhoid fever with transient albuminuria showing 20 per cent albumen. Pulse is more rapid in typhoid. The typhoid would not recover so quickly as this case is doing.

Diagnosis from malarial fever: The patient had but one paroxysm, one chill; was sick all the time, not feeling better one or two days and then worse. Spleen not enlarged. Tongue was pointed and red at tip, not thick, broad, and indented. Does not show a malarial aspect producing anemia. Yellowness is not over the whole body; not an even yellowness; the eyes have a bruised, lemon-yellow hue, not a bright shining, nor greenish yellow. No history of skin being dry, parched

and hot any time, but always moist. Stools have not been hard, clay-colored stools. Urine showed no bile, nor blood, as might be called malarial hematuria. No history of vomiting of bile only. Vomiting first occurred on second day, and not right at the beginning. I will further state, I have never seen a typhoid case nor a malarial-fever patient look like the patient described. I have seen an exactly similar case in Mississippi, and at the Soldiers' Home at Hampton. I therefore concluded that the case was one of yellow fever.

I inclose temperature chart and tabulated urinary analysis. The temperature chart is not complete. I believe that the reason that the temperature on Tuesday, October 3, was 102 (evening) was that the patient's bowels had not moved the day before; he showed a tendency to constipation. Had the patient, also, been in better quarters, and not exposed to climatic influences, he would have recovered earlier, and his temperature would have reached normal earlier.

The reason for so late a black stool, I explain, as due to the slow action of calomel, and that it must have taken some time for this black material to get down along that long flat intestine.

Respectfully, yours,

R. H. VON EZDORF,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE HOSPITAL SERVICE.
(Through P. A. Surg. W. G. Stimpson.)

[Inclosure.]

Record of examination.

OCTOBER 12, 1899.

September 29, 1899, no albumen; September 30, 1899, no albumen; October 3 and 4, 1899, 20 per cent albumen (by volume) present; October 5, 1899, 13 per cent albumen (by volume) present; October 9 and 10, 1899, no albumen, no bile.

Tests used: Heat and nitric acid; Esbach's picric acid test with heat.

SUPPLEMENTAL CLINICAL REPORT BY ASSISTANT SURGEON VON EZDORF.

MIAMI, FLA., *October 16, 1899.*

SIR: I have the honor to respectfully request that the following additional notes be added to the history of "Austen," reported in my letter of October 12, 1899:

October 5. Pressure made on the skin discolored it, making it red, which remained about one-half minute and then returning to the icteric hue.

The blood examination reported from the hygienic laboratory gave negative result with Widal's reaction for typhoid. This case had first been diagnosed typhoid by the attending physician, and therefore the request was made for this examination. The patient, Austen, has recovered; has no complaints except weakness, and an appetite.

Respectfully, yours,

R. H. VON EZDORF,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.
(Through P. A. Surg. W. G. Stimpson.)

REPORT FROM PASSED ASSISTANT SURGEON STIMPSON ON CONDITIONS IN MIAMI AND HISTORY OF THE PREVAILING FEVER.

MIAMI, FLA., *October 12, 1899.*

SIR: I have the honor to forward the following report upon the fever epidemic in this city:

The city of Miami is situated on the west shore of Biscayne Bay. It is only

three years old, and part of the city is still covered with the original forest. A large hotel, the Royal Palm, capable of accommodating 500 guests, has been built on the southeast corner where the Miami River empties into the bay.

It is surrounded by a beautiful park, and facing this park are a number of well-constructed modern cottages. These cottages extend for several blocks to the westward, and are inhabited by the well-to-do people of the city. Beyond the cottages, further to the westward, is the business portion of the town, clustered around the junction of Twelfth street and Avenue D. North of Twelfth street, between it and the railroad, is a portion of the city called "the Hammock." It is covered by the original forest, and, in places where this has been cut off, by a dense undergrowth. The "Hammock" is inhabited by a number of white people who live in small houses and shacks. On Avenue D, between Third and Sixth streets to the north of the railroad, dwell some more white people in neat cottages. All the colored people live together in a town to themselves to the west of the railroad, between First and Ninth streets.

The city of Miami is nearly level, and is built upon coral rock. This rock is exposed in many places, and in others is covered by a soil only a few inches in depth. The streets have been made by digging out and pounding up this rock, and in the best portion of the city they are hard, smooth, and well drained. The cottages near the Royal Palm, and some of the houses in the business portion, have flush water-closets connected with the sewers. There are no water-closets in the rest of the town with the exception of one at the depot. The people in "the Hammock" and the rest of the town use privies containing buckets, which are changed when they are full.

The town is supplied with water from a spring in the everglades a few miles away. This water is not, however, supplied to the whole of the city, and many persons drink surface water obtained from wells driven 8 to 12 feet in the rock. These wells are frequently placed only a few feet from the privies.

Dr. Jackson, agent State board of health, informs me that most of his cases of this fever have been in "the Hammock," and that in that part of the city whole families, children and adults, would be attacked at one time or one member of the family would become ill as soon as the other recovered. In the better portion of the city, he says, frequently only one or two members in a family would be attacked, and he attributes this to their living under better hygienic conditions. None of the colored people, as far as known, have had the disease.

* * * * *

I can not learn of anyone having been sick in "the Hammock" with fever until July.

The first case of reported dengue of which I can find any record occurred here July 9. The patient was a child 2 years old and the house in which it was taken sick is in "the Hammock," on Eleventh street between Avenues D and C, two and a half blocks from the house where Knowlton died. The next case is a man named Silcox, living one-half block from this case, who was taken sick 9 a. m., July 15, with headache, fever, and pain in the back. He doesn't remember having had a chill, nor did he have pains in any other part of his body. He was sick for six days, but only had fever for a few days. He was very hungry when he was getting well and felt weak for a week or two. His physician said he had no rash. After this case the fever is hard to trace, as it cropped up in other parts of the city. One man whom I saw to-day said he and his brother became sick on the same day, July 19, 1899. He gave the same history of his case as Silcox, only he vomited after taking medicine on the second day.

A serious case occurred here August 1, the patient being a man named Featherly. His physician, Dr. Jackson, told me he thought at first that this case was suspicious, but concluded afterwards it was dengue, as the secondary rash

appeared. Dr. Horsey, assistant State health officer, saw this case. The rash of dengue has been found only in about one-half the cases, and consists of a redness more or less marked of the face and neck, noticeable at the beginning of the attack. I have been shown a few cases of so-called rash occurring during convalescence, but in most of these cases I have been unable to see any rash, only an undefined spot or two. In one case seen by Dr. Von Ezdorf and myself the patient's hands were red, and another case had a few small spots, macular in character, around the kneejoint. In only one case, a young girl, have I noticed puffiness of the eyelids.

I have already forwarded a history of Anderson's case, the refugee from Key West, and Dr. Von Ezdorf has sent descriptions of the cases of Holly, Sanders, and Austen, and also of the lighter cases he has seen here. Hargroove, the yellow-fever patient who died in the Miami hotel September 26, had a typical case of yellow fever, including black vomit.

Assistant Surgeon Von Ezdorf and myself believe that yellow fever has been in this city in a mild form since the middle of July, and that there have also been cases of dengue here. It is difficult to say how this fever originated in this city.

The small number of cases that have been occurring recently is, in our opinion, due to the partial depopulation of the place and to the fact that probably one-half of the white people now present in the city have had the prevailing disease.

I will further state that with the probable existence of mild yellow fever some unknown foci may remain, and as danger thereby exists of its reappearance next year such trouble may be looked for.

Respectfully, yours,

WM. G. STIMPSON.

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT FROM PASSED ASSISTANT SURGEON STIMPSON ON MEASURES TAKEN TO PREVENT THE SPREAD OF FEVER IN MIAMI.

MIAMI, FLA., *October 13, 1899.*

SIR: Referring to Bureau letter of the 5th instant in regard to the fever in this city I have the honor to state that I have a record of the houses where cases or suspected cases of yellow fever have occurred that have been seen by Dr. Von Ezdorf, and I also have a list of the dengue cases which have been treated by one of the physicians here since July 9. Most of the cases have been under the care of Dr. J. M. Jackson, the agent of the State board of health. Dr. Jackson has promised to give me a list of these patients. The largest number of these cases, he tells me, have been among the people in the "hammock." (See my letter of October 12.) The houses in the "hammock" are small and ill constructed, some of them being mere shacks. They do not have doors or windows, or if they do they are seldom closed. Screens to keep out mosquitoes are used in their place. Gaseous disinfection of these houses by sulphur or formaldehyde is impracticable, as the cracks in the roofs, floors, and walls are too numerous to stop up. Dr. Von Ezdorf and myself recommend that these houses be made mechanically clean, and that all bedding, clothing, and other fabrics be sunned and aired for seven days, this work to be done thoroughly, under supervision of reliable inspectors. As the houses are open, and have had at all times a free circulation of air through them, we think this will be sufficient. The weather has been good the last eight days, and a little of this work has already been done, but imperfectly, and we do not think the desired results have been obtained.

The Hotel Miami has been disinfected by Dr. Horsey with sulphur, some of the rooms being also treated with formaldehyde. The room in which the patient

died and the contiguous rooms were washed down with bichloride solution. All bedding and fabrics in these rooms were burned.

Respectfully, yours,

WM. G. STIMPSON,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Telegram.]

Diagnosis of yellow fever.

MIAMI, FLA., October 16, 1899.

Surgeon-General WYMAN,

Washington, D. C.:

One patient is seriously ill. Horsey says is very suspicious. Ezdorf reports the patient has an unmistakable attack of yellow fever. Urine contains 25 per cent albumen. Jaundice nearly moribund. Horsey says will not make diagnosis of yellow fever unless autopsy confirms diagnosis. Ezdorf says the new cases can not be traced to foci already located.

STIMPSON.

CLINICAL REPORT OF A CASE OF YELLOW FEVER—DIAGNOSIS CONFIRMED.

By Assistant Surgeon VON EZDORF.

MIAMI, FLA., October 21, 1899.

SIR: I have the honor to herewith forward the history and necropsy findings in the case of James Flye, diagnosed by me as yellow fever (see telegram, October 16, 1899). Diagnosis confirmed by Surgeon Murray.

James Flye, white; aged 60 years. Previous history: Two weeks ago patient thought "liver was out of order;" saw Dr. S., who gave him some medicine. On October 11, 1899, Dr. S. was called to see him; made call in the morning; found temperature, 101; pulse, 84; had a little headache and backache.

October 12: Temperature, 100.5; pulse, 84; had nausea after taking some medicine.

October 13: Temperature, 98.5; pulse, 64.

October 14: Not seen.

October 15: Temperature, 102; pulse, 110.

October 16: Seen by me for the first time; pulse, 132. Patient was lying in a stupor from which he could be aroused. Eyes were open, pupils dilated, the left a little more than right. Icterus of eyes marked. Icterus of skin of chest marked; skin moist. When skin is pinched up leaves red mark which remains for nearly one-half minute. Urinary secretion (to-day) suppressed. Urine obtained by catheter was highly colored; showed albumen present about 25 per cent or more. Tenderness over epigastrium, very marked; slight pressure would cause the patient to cry out that it pained. This also caused the patient to contract his brow, when the skin of brow showed a yellowness. Gums, pale but puffy. Feet and legs were cold although sweating. Patient died 6.50 p. m.

Necropsy held by electric light 9.10 p. m. Male; 6 feet tall, thin. Rigor mortis marked, body yellowish; eyes, paler yellow than before death; both pupils dilated. Hypostasis in dependent portions of trunk and slight of legs; also some hypostasis over chest and neck. Intercostal margin prominent. Incision median line shows tissues dry, the dissection of flaps dry; small quantity of fat in the abdominal wall. Vessels of mesentery injected in upper part. Intestines small, and nearly empty. Liver had old adhesions over right lobe, beginning at the right intercostal

margin and extending toward the right; on surface had a mottled, pale appearance; color of liver was about that between new leather and brick dust. There were (to my mind and Dr. Stimpson's) large plaques of yellow—these plaques mottled, very light yellow. No fat on blade of scalpel on section. The appearance on section was same as on surface. Section of the right lobe was very dry. Section of left lobe showed some oozing of blood from the veins. Spleen was normal in size, friable. Kidneys swollen and enlarged. A cyst was on surface of left kidney; also a large ecchymotic spot size of thumb nail on surface. Section showed congestion. Stomach, external vessels injected; no erosion of mucous membrane. Ecchymotic spots of mucosa and submucosa, with slight congestion, involving the middle third of stomach, extending along smaller and greater curvatures toward oesophagus. There was a spot size 3 by 2 inches, pigmented, and pale white in cardiac end of stomach. Pyloric end normal; no free hemorrhage; no black vomit. Fluid in stomach was dirty gray, with streaks of reddish-black mucous. The duodenum was injected with numerous ecchymotic spots in mucosa and submucosa. There were scattered ecchymotic spots in mucosa a short distance below the duodenum. Some dark mucous adherent to duodenal mucosa. Vasa vasorum of aorta were very markedly injected. Some ecchymotic spots over aorta close to heart; also a few ecchymotic spots on heart surface. Vasa vasorum of pericardium injected.

Respectfully yours,

R. H. VON EZDORF,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.
(Through P. A. Surg. W. G. Stimpson.)

[Telegram.]

Nineteen cases of yellow fever.

MIAMI, FLA., *October 24, 1899.*

WYMAN, *Washington, D. C.:*

State health officer reports 19 cases yellow fever here, 1 moribund. He requests me to ask you to have detention camp established at Fulford, 10 miles from here, the camp to be under management and control of United States Marine-Hospital Service. He thinks camp should be large enough to hold 75 refugees.

STIMPSON.

ADDITIONAL REPORT FROM PASSED ASSISTANT SURGEON STIMPSON ON THE CHARACTER AND HISTORY OF THE PREVAILING FEVER AT MIAMI.

CAMP McADAM, FULFORD, FLA.,

November 14, 1899.

SIR: In reply to Bureau letter dated October 25, 1899, directing me to begin immediately an investigation of the character of the fever which has existed at Miami. I have the honor to state that I have been making this investigation for some time, and that I have found that a number of persons here who are suffering with yellow fever, or who have recently suffered from yellow fever, had dengue during the summer, as shown by the following histories:

Mr. S., carpenter, and his wife were taken sick at 8 o'clock in the evening about August 20. Neither one had a chill, but they had fever, headache, backache, and severe pains in their legs. The man had nausea and vomiting when he was first taken ill; sickness lasted about six days and they were weak afterwards, but had no appetite and they did not feel like eating for two weeks. The pains were severe

for several weeks after they were able to get around. The woman had a rash over her body specially marked on her back. This rash was so severe her physician gave her an ointment to rub on it. The man only had the rash on the inside of the thighs.

Mr. S.'s two children had this fever in a very light form and both of them had rashes. Mr. S. had yellow fever in 1874 on a vessel coming from Pernambuco to New York, seven out of a crew of seventeen dying on the voyage. When the vessel reached New York the quarantine officer told them the fever with which they were suffering was yellow fever. Mrs. S. and one child are just recovering from yellow fever.

Mr. G. an immune of the yellow-fever epidemic of 1873 in Memphis had dengue in Miami in August, and suffered greatly from pains for some time after he got out of bed.

Dr. H. treated a Miss Q. in August. She had a red rash and pains for some time after the fever left her. The grandmother of this girl was taken sick with yellow fever in October, and the week afterwards Mrs. Q. and her daughter, the same one that had dengue in August, became ill at exactly the same time, 10 o'clock at night, with a chill, headache, backache, injected eyes, and all the typical symptoms of yellow fever; since then the fever has attacked other members of the family.

I believe that yellow fever has been present in Miami since February, Mr. K. being the first case I have been able to trace. His sickness is described in my letter of October 12. Mr. K. had not been away from the city during the winter, and I have been unable to find out from what source he became infected. The only other person in Mr. K.'s house was his wife. She was not sick, but she is said to have had "dengue" in August.

Mrs. H., who lives one-half a block from Mr. K.'s residence, was taken sick between 10 and 11 a. m. March 3 with a chill, headache, and backache. She vomited on the second day and her menses came on the third day; she was very weak, but managed to get up on the sixth day to wait on her husband, who was taken with the same fever. She remained up a few days and then had a relapse, her second attack being worse than the first. She had constant vomiting, and while sick had no appetite; she suffered with severe pains in her stomach and back. She states she had a red rash over her body like prickly heat; no one else had this rash except one of her boys. Her husband had a severe chill at 12 o'clock midnight March 9; he went to sleep afterwards, but woke up with a bad headache, backache, and pains all over. He did not vomit until the next afternoon; his throat was dry, and he was so weak he could not raise his head from the pillow; on the third day all pains left him, and he tried to get up but fainted. He got up on the sixth day and walked slowly downtown, but soon came back and stayed in bed all day; the seventh day he sat up, and the eighth day he went to work. He had no pains after the first few days. His six children were taken sick after he recovered. Mrs. H. had not visited Mr. K.'s, but she had frequently met Mrs. K. in a tent next door to Mrs. H.'s house, where Mrs. K.'s mother lived. Mrs. K.'s mother was taken sick after Mrs. H. recovered, and was sick for some time.

Mrs. R., who lives in a house one block from Mr. K.'s residence, was taken sick during the evening of March 31 with a severe chill, headache, backache, and pains like "grippe pains." She had the fever for five days and could not eat anything; she had a feeling of uneasiness, and was afraid of vomiting; after the fever left her she had a great appetite—could not get enough to eat; she suffered from no pains, after the initial symptoms; there was no rash, but she had peeling of the skin during convalescence. Mr. R. was taken sick April 6. He had the same symptoms, except the chill and the backache. His taste was blunted for a long time afterwards; water tasted insipid, flat. He had no rash or peeling of skin. Mr. R.'s child had fever for two days while its father was sick. The child had no rash,

During the months of March and April nearly everyone in that neighborhood living within a radius of 100 yards of Mr. K.'s house had this fever. In many cases every member of the family would be attacked in succession. In all, about 15 persons were sick.

I have been unable to obtain histories of any cases in May and June. These months are very dry—the driest of the year. In my letter of October 12 I described a number of cases which occurred in July, August, and September. Since then I have obtained the histories of some more cases, as follows:

Mr. W. moved into a house in the same block as the one in which Mr. K. lived in June. He became ill in the latter part of August at 9 p. m. He had a chill, headache, and backache. Was sick about six days. Had an enormous appetite when he was getting well. He was very weak, and a red spot formed on the side of his face which he was afraid would “gather and burst.” Mr. G. S., who lives next door, says he saw Mr. W. when he was able to walk around, and he states Mr. W. was decidedly yellow, and he thought he had jaundice. Ten days after he was sick his sister-in-law became ill, and had the same symptoms he had had except the red spot on the face. The sister-in-law had a red rash and peeling of the skin on the shoulders and hands. After this his two children became sick, and were affected the same way. The children each had a rash and a peeling of skin. Mr. W.'s father-in-law had the same fever after the children. He ate too much during convalescence, and had a relapse. His case was pronounced yellow fever, and is included in Dr. Porter's list of persons who have had yellow fever in Miami. Mr. W.'s wife has also had yellow fever.

The son of Mr. H., who lives across the street from Mr. W., had this same fever twelve days after Mr. W. was taken sick. There was constant communication between the families during Mr. W.'s sickness. There are six persons in Mr. H.'s family, and everyone of them had the fever, one after the other, in the same manner as the family of Mr. W. One family by the name of Holly, living just back of Mr. H.'s house, did not have fever in March, but had yellow fever in September. Dr. Von Ezdorf has already sent a description of Mr. Holly's case to the Bureau.

Nearly all cases of fever in Miami in July, August, and September were called dengue.

Respectfully, yours,

WM. G. STIMPSON,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT FROM PASSED ASSISTANT SURGEON STIMPSON ON MEANS EMPLOYED TO
PREVENT FOMITES BEING CARRIED INTO NORTHERN FLORIDA.

CAMP MCADAM, FULFORD, FLA.,

November 21, 1899.

SIR: In reply to Bureau letter of the 15th instant, inquiring as to the means employed by the State board of health to prevent fomites of yellow fever from being carried into the northern portions of Florida and possibly giving rise to a focus or foci of infection there next spring, I have the honor to forward a letter from Asst. Surg. L. D. Fricks, stationed in Miami, giving a statement of what is being done by the board in Miami and Key West and what they intend to do. These papers were submitted to Assistant Surgeon Von Ezdorf, with request that he make any suggestions that might occur to him. His suggestion that inspectors be employed by the State board to make the people carry out its instructions, I think, is a good one, and I will request Dr. Fricks to speak to Dr. Porter of the advisability of doing it.

I think fomites have possibly already been carried to different parts of the State of Florida from Miami, as the disease probably existed there in August and possibly earlier. No restrictions whatsoever were placed upon travel until after the Hargrove case, the latter part of September, and these restrictions were not strictly enforced until the town was quarantined October 20, 1899. During this time fomites may have been carried away from the town to other places, and, if packed away, may give rise to foci next spring. There have also been rumors of cases of fever in Tampa, St. Augustine, Palm Beach, and other places, so that fomites may be already in these places from mild cases which have occurred but have not been recognized or reported as yellow fever. During the summer and fall there were mild cases of fever in Cocanut Grove and Lemon City. Neither Dr. Von Ezdorf or myself saw any of these cases, but in all probability some of them were yellow fever, as there had been daily communication between the two places. As there is a possibility of fomites being already in the towns along the East coast, I would suggest that persons in these places be instructed to thoroughly sun and air all textile fabrics, and that inspectors be employed to see that these instructions are carried out, so as to prevent the fever from recurring in these places next year.

In regard to the order forbidding removal of household goods from Miami and Key West, I would suggest that the order be made to apply also to the removal of dry goods, this order not to restrict the sale of such goods in small quantities to customers, but to prevent their being packed up and shipped out of the city in bulk.

Respectfully, yours,

WM. G. STIMPSON,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure.]

MIAMI, FLA., November 20, 1899.

DEAR DOCTOR: In reply to your letter of even date requesting such information as I can gather concerning means adopted by the State health officials for post-epidemic disinfection, both in Key West and Miami, I will inclose a proclamation issued by the State health officer, on the 14th instant, to the citizens of Key West. Dr. Sweeting, acting health officer at Key West, has not yet reported whether the people are complying with order, and Dr. Porter says positively that until they do no quarantine restrictions will be removed. The last clause, "except as regards household goods," I heard discussed by Dr. Carter and Dr. Porter in Key West, during the epidemic, and they concluded that no household goods ought to be shipped from there during the winter. This, Dr. Porter states, is his intention, and tells me also that personal baggage coming from houses known to have been infected shall undergo disinfection.

I am informed that the same restrictions regarding household goods will be applied to Miami; but a different mode of disinfection (I am not sure that it can be called post-epidemic) was instituted by the State authorities on the 20th instant.

I believe that you were convinced that the Miami Hotel and that portion of the town known as the "hammock" were the centers of infection about September 15. I think they were. Providence began the disinfection thoroughly on the 13th instant by the burning of the hotel and the infected houses across the street, and the State board took charge of the "hammock" to-day. Five or six of those small "shacks" which were very badly infected will be burned, and in those houses where all the family have been sick the inmates will be moved while the building is being fumigated. All bedding and clothing will be disinfected by steam on board the *Santa Lucia*.

As the most dangerous foci of infection were materially lessened by removal to hospital of a number of cases from among the poorer classes, they might hope to accomplish the much-desired result were it not for the fact that the disease is just now beginning to invade the negro settlement in the southern part of the town, in which, as you know, there are over 500 negroes, making a small colony of their own.

The disinfection above-mentioned can easily be accomplished in ten days, and then, as I understand the mode of procedure, they will attempt the partially infected houses.

Dr. Porter wrote the circuit judge to-day that it was impossible to tell him when he could come to Miami for court. In my opinion there will be cases among the negroes until near the 15th of December. However, no one is frightened about the fever, and none of the people seem to care to leave, except as a matter of convenience, or to get a better job somewhere else.

Very respectfully,

L. D. FRICKS,
Assistant Surgeon, M. H. S.

P. A. Surg. W. G. STIMPSON,
Camp McAdam, Fulford, Fla.

[Inclosure.—Proclamation.]

MIAMI, FLA., November 14, 1899.

To the citizens of Key West:

A decrease in the number of cases of yellow fever at Key West, as reported for the past three weeks, and the total absence from the thickly settled portions of the city, makes it possible and desirable to remove the embargo on travel which has restricted the movements of the people for the last three months. The spread of infection of yellow fever over the city has been general, but the reported cases by no means represent the total number which have sickened from yellow fever, for the reason that many parents treated their own children, and among the native children and native negroes the disease was so mild, as a rule, as to require but little medication and no professional assistance. Therefore it is neither possible nor practicable to undertake a general chemical or artificial disinfection of houses, because such an attempt would be to guarantee that a total destruction of yellow-fever contagium had been made in the entire city, which, as a scientific certainty, under the circumstances as cited above, it is impossible to insure.

It is believed, however, that quarantine measures can be relieved of their stringency and withdrawn and the city be made reasonably safe for nonimmunes when the householders and housekeepers of Key West shall have instituted a general cleaning and airing of their houses and homes by exposing all bedding and bedroom furnishings, such as mattresses, pillows, curtains, portieres, rugs, and carpets, to sunlight and air for three successive days, and by a careful and vigorous sweeping of rooms. Storekeepers must remove all goods from shelves and clean and brush both goods and shelves before replacing. Especially must this latter be done in those stores where families have lived in the rear thereof and have had sickness.

Accordingly, I request of the citizens of Key West a prompt compliance with the requirements as set forth, to the end that when it is reported by the agent of the State board of health for Monroe County that the same has been done by the citizens of Key West, then quarantine restrictions on travel to and from Key West, except as relating to household goods, may be removed.

J. Y. PORTER,
State Health Officer.

REPORT OF ASST. SURG. L. D. FRICKS ON MEASURES TO PREVENT EGRESS FROM
MIAMI SAVE THROUGH CAMP McADAM.MIAMI, FLA., *November 18, 1899.*

SIR: I have the honor to report that, in obedience to your orders of the 15th instant, I was ordered by Passed Assistant Surgeon Stimpson to proceed to Miami and find out by what means persons were leaving Miami except through Camp McAdam.

My first report was made by telegram on the 16th instant, and since that time I have inspected both land and water patrol. In my opinion, all persons leaving Miami since October 16 by rail have done so with the consent of the State health officer, and he assures me that he has issued permits to immunes only, after disinfection of their baggage.

The only means of leaving Miami overland is by the Florida East Coast Railroad or the wagon roads going north, and these are guarded, first, by a cordon placed at the city limits, and, second, by another cordon 30 miles above, at New River, just south of the relay station, Fort Lauderdale.

The water patrol consists of only two naphtha launches patrolling south of the city in Biscayne Bay and guards along the water front. These could be easily avoided, either by coming in to the east through the keys or by coming down the bay from the north. I did so. But I doubt very much if anyone has left in this way, because the boat would have to come from the outside and then return, landing above Fort Lauderdale.

The greatest danger, I think, was from refugees leaving about the 1st of September.

I located the persons referred to at Jacksonville in Dr. Stimpson's telegram of the 15th instant. They left here September 7, and were, I think, very suspicious.

Respectfully,

L. D. FRICKS,

Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF ESTABLISHMENT AND MANAGEMENT OF CAMP McADAM, A
DETENTION CAMP, AT FULFORD, FLA.

By P. A. Surg. W. G. STIMPSON.

On October 24, 1899, the State health officer of Florida requested the Surgeon-General of the Marine-Hospital Service to establish a detention camp a few miles outside of the city of Miami, so that persons quarantined in Miami would be able, after staying ten days in camp, to proceed to other parts of the State and to points North. During the afternoon Asst. Surg. R. H. von Ezdorf, M. H. S., and myself, upon the invitation of C. H. Bradley, esq., agent for the Florida East Coast Railway Company, took a trip on the afternoon train and inspected all the stations on the road between Miami and Fort Lauderdale. We came to the conclusion that the best site for a camp was an orange grove belonging to Judge P. W. White at Fulford, 14 miles from Miami. There was a good siding and railroad warehouse at this place, and opposite to the warehouse was a large packing house divided into two rooms, a large and a small one.

The orange trees were small, growing in a sandy soil a few inches in depth, under which was a solid bed of porous rock. The land sloped toward the railroad on the west, and on the east was bounded by a small bluff, beyond which, at a distance of 100 yards, ran Little Snake Creek, bordered by dense undergrowth. On the other side of the railroad was another small orange grove, also the property

of Judge White. Little Snake Creek makes a nearly complete circle around this land, and, owing to its marshy edges, forms a natural barrier difficult for any one to cross. The county road runs through this land, near the railroad track, and crosses the creek a short distance from the railroad bridge.

When I returned to Miami I received word from the Supervising Surgeon-General that he had ordered tents and outfits from Mullet Key to Fort Lauderdale, and I wired him in regard to the orange grove at Fulford. The next day I received a reply that the Fulford site was approved. So I sent Dr. von Ezdorf to make a further inspection of the place and to engage carpenters, etc. Mr. W. W. Prout, of Miami, kindly volunteered to take him in his carriage, and when they returned the following telegram was sent to the owner of the land, Judge White:

"Will you grant permission to Government to establish detention camp in northwest corner of your Snake Creek grove by railroad track? Government guarantees payment for all damages, if any, to your grove. Will employ man specially to guard grove and property; no other place available. Your permission means much to us at this hour. Answer by wire W. W. Prout. Request the above be granted, and please wire terms for rental. W. G. Stimpson, passed assistant surgeon, M. H. S." To this Judge White replied the next day: "Your request is granted. I expect only a reasonable rental."

As soon as this reply was received I proceeded to Fulford and started laborers to work clearing the land of weeds and carpenters to building tent floors, out-houses, etc. Three air-tight compartments 7 feet square were constructed in the railroad warehouse for disinfection of baggage. The next day the cars carrying the tents and outfits arrived from Port Tampa, and everyone was put to work unloading the cars and setting up the tents. This was a labor of considerable difficulty, as six holes had to be dug 3 feet in depth in the solid rock for each tent. The tent guys were secured to cross pieces placed on posts in these holes, thus making it easy to hold the tent firmly in its place. Thirty-one tents were erected in the orange grove for the white guests, guards, and white employees, and five tents on the other side of the railroad for the colored employees. Two tents were placed near the railroad warehouse to be used as dressing tents. A quarter mile to the south in the pine woods four tents were pitched as an intermediate camp and a little farther on eight more tents as a hospital. The kitchen range that came with the outfit was placed in the small room of the packing house, and the large room, 30 by 36 feet, was fitted up as a dining room. There was a good well near the kitchen, and another one was driven in the center of the camp and one at the hospital.

The camp was ready to receive guests on November 1, and the next day thirty-six persons arrived. Their baggage, body clothing, and everything that they had with them was disinfected before it was allowed in the camp. Nearly everyone sent out a change of clothing the day before, so that most of the people were able to put on disinfected clothing as soon as they arrived; those who did not do this had to wait six hours until their clothing could be disinfected. All disinfection was done with formaldehyde gas. Supplies, with the exception of lumber and a small quantity of hardware, were obtained from Titusville and Jacksonville.

An inspection of everyone in camp was made every day, morning and evening; the captain of the guard accompanied the medical officer and checked off in a small book each person as he was inspected. Nearly all the employees in the camp came from Miami, so all of them had to be carefully inspected the first ten days after their arrival. Only one of the employees had yellow fever, a guard, who was taken sick six days after coming to the camp. There were a great many women and children among the refugees, and great care had to be taken to see that no mild cases of yellow fever escaped observation. Five cases of yellow fever were sent to the hospital; one of them had the fever when he arrived from Miami. All

of these cases were found when they were first attacked and were immediately removed; the tent and everything in it was thoroughly disinfected, and the other inmates were required to change their clothing and put on disinfected garments. The camp was closed November 21, 1899, 217 persons having passed through it.

The personnel of the camp consisted of P. A. Surg. William G. Stimpson, in command; Assistant Surgeon von Ezdorf, in charge of hospital; Acting Asst. Surg. A. R. Hagen, who was detailed to make the morning and evening inspection; Hospital Steward F. H. Peck; Captain of the Guard J. B. Richards; Clerk Guild Smith; Foreman J. F. Kennett; Bugler C. B. Thompson; Telegraph Operator E. M. Doyle; 20 guards, 2 disinfectors, 25 cooks, waiters, outdoor men, etc.

I inclose a copy of a resolution of thanks signed by the guests of the camp and also a copy of the rules of the camp. These rules were prepared by Messrs. Peck and Richards.

RESOLUTION OF THANKS.

CAMP McADAM, FLA., *November 19, 1899.*

We, the undersigned guests of Camp McAdam, wishing to express our appreciation for the uniform kindness and courtesy with which we have been treated during our stay here, take this method of publicly expressing our gratitude to Dr. W. G. Stimpson, of the United States Marine-Hospital Service, and his corps of able assistants for the many favors extended, and further to express our admiration for the able and effective methods used by them in keeping the disease from spreading in the camp by the immediate removal of all cases of sickness from whatever cause to the "suspect" camp.

Further, that a copy of the above, with our respective signatures, be sent to the Florida Times-Union and Citizen, the Miami Metropolis, and the Miami News for publication.

JAS. T. SANDERS,
J. N. GWINNER,
D. W. McCOMB,
C. FRED BLACKBURN,
JOHN M. TOWNLEY,
H. F. FERRIS,

[And others.]

CAMP REGULATIONS, CAMP McADAM, FULFORD, FLA.

The following rules and regulations are published for the guidance of guests of this camp, and will be strictly enforced:

1. Guests will be required on entering camp to provide themselves with a change of clothing, which must be sent one day in advance of guest's arrival for the purpose of disinfection. On the arrival of guests they will be required to immediately remove the clothing worn and clothe themselves in the disinfected clothing before their assignment to quarters, dressing tents being provided for the purpose.

2. The following will be the camp routine: Breakfast, 7 a. m.; sick call, 9 a. m.; dinner, 12 noon; sick call, 3 p. m.; supper, 5 p. m.; tattoo, 9.30 p. m.; taps, 10 p. m. "Tattoo" will be the signal for all persons to return to their own quarters and prepare for retirement. At "taps" all lights must be extinguished promptly and all conversation or other noise cease.

3. All guests will be required to respond promptly to the call for meals, and anyone failing to be in the dining room within thirty minutes after call will be refused admittance.

4. At the "sick call" at 9 a. m. and 3 p. m. each guest will be required to be in front of his or her quarters, ready for inspection by the medical officer, and must remain there until after a complete inspection of all, which will be announced by bugle call—"recall." As this is the only restriction placed upon guests, and is essential to the health of the camp, any infraction of this rule will result in the arrest of the offender, and upon repetition will result in their return to the infected district.

5. No baggage, excepting hand baggage, will be allowed in the quarters. Trunks, boxes, etc., will be left in the baggage room until discharged from camp, where it will be carefully guarded, and if necessary can be opened by applying to the captain of the guard between the hours of 2 and 3 o'clock p. m.

6. The necessary bedding, linen, and tent furniture is provided by the camp, but guests will be required to clean thoroughly their tents and adjacent camp streets before 9 a. m. each day. They will also be held strictly accountable for all breakage and careless handling of Government property.

7. All rubbish and dirt from tents and streets must be piled immediately in front of each tent in a compact pile, from where it can be readily removed by camp scavenger. All lamps requiring filling must be placed in front of the tent by 9 a. m., and in plain view.

8. All applications for medicine and medical attendance for minor ailments must be made at "sick call," 9 a. m. and 3 p. m.

9. All instructions transmitted by officers of the camp or guards must be implicitly obeyed without question. If any guest considers himself in any way unfairly dealt with and desires to complain, complaint must be made in writing, stating fully the grievance, and transmitted to the commanding officer through the captain of the guard.

10. Profane or abusive language, gambling, quarreling, drunkenness, or any conduct unbecoming a lady or gentleman will not be tolerated. Intoxicating liquors or firearms will not be allowed in camp, and will be taken by the captain of the guard and returned upon discharge.

11. Regular meals will be served in the dining room and must be eaten there. No extras or delicacies will be supplied by the camp, except such as are served in the dining room.

12. Articles of diet not found on the tables at regular meals can only be obtained by order of the camp medical officer.

13. No attendants will be allowed to receive fees.

14. Conversation with the guards on duty not allowed.

15. The following personal hygienic rules are recommended to all guests: Avoid chilling of the body; avoid night air; see that the bowels move once daily.

16. On clear days all bedding and mattresses must be sunned and aired between the hours of 11 a. m. and 2 p. m.

It is earnestly hoped that guests will cheerfully comply with all rules to avoid unpleasantness, as it is not desired to resort to force and the camp guardhouse to maintain rules that are absolutely necessary for the discipline of the camp.

By order of—

WM. G. STIMPSON,

Passed Assistant Surgeon, M. H. S., Commanding.

THE YELLOW FEVER AT PORT TAMPA CITY, FLA., FALL OF 1899.

A case of yellow fever was reported on September 4 at Port Tampa City, Fla., in the person of one John Welsh. Below is the report of Surg. H. R. Carter on the case in question and the cases following

it, accompanied by a list of all persons who were attacked by the disease, so far as could be ascertained, to November 17.

There appear to have been in all ten cases, with one death, but there was at no time any serious spread of the disease at Port Tampa City, nor does there appear to have been any case at Tampa.

In keeping with the effort made to show the responsibility of the Service for the admission of yellow fever at Key West by failure to detect and disinfect the false bottom of a trunk at Habana, and at Miami by faulty disinfection of the steamer *Laura* at Nuevitas, a like effort was made to attribute the admission of the fever at Port Tampa City to certain barges plying between Habana and Port Tampa; and this last assumption is as easily disproven as the others.

Having logically shown that Key West was infected with yellow fever at least as early as August 1, that no precautions were taken at Port Tampa against Key West until August 31, and taking into consideration the fact that there were three steamers a week from Key West to Tampa without any precautions whatever being taken, it would be illogical to assume that the yellow fever was imported into Port Tampa City by barges from Habana, over which the most careful supervision was exercised.

There were three steamers a week from Key West, and in addition there were sailing vessels, none of which were disinfected or in any way guarded against until after September 1, and the most probable source of infection of Port Tampa City was Key West.

REPORT OF SURG. H. R. CARTER UPON THE YELLOW FEVER AT PORT TAMPA CITY, FALL OF 1899.

PORT TAMPA, FLA., *November 16, 1899.*

SIR: In confirmation of my wire of to-day, I would say Dr. Altree and his brother, Dr. Roland Altree, prepared a list of all the cases which had occurred in their practice since September 4, which at the time of attendance, or looking back on them, they judged to be suspicious of yellow fever.

The list begins with John Welsh, who was reported as developing yellow fever September 4. The cases are marked as positive or suspicious by the physician who attended them. There are, counting Welsh, nine cases considered positive and twelve cases doubtful. From the history I think several cases have been included in the latter class which were pretty certainly not yellow fever. These gentlemen have about four-fifths of the practice at Port Tampa and Port Tampa City.

Following Welsh, the next reported case is Mr. Eppes, living and working at the Port Tampa docks. I can not, nor can Dr. Altree nor Dr. Weedon, trace any connection whatever between infection which Welsh might have caused and this case, yet it is logical to believe that such connections exist, and not to predicate two introductions.

If the doubtful cases be now considered, three other men developed yellow fever so soon after Eppes that it would point strongly to a common exposure, at least of three of them. All worked or frequented the docks. It is to be noted, however, that none of these three are positive cases, and one (Cooper) I am decidedly of the opinion was not yellow fever, as is Dr. Weedon.

Up to October 27 no cases, positive (of which there were five) or doubtful (of which there were three), occurred in which the infection could not have been

contracted about Port Tampa docks if a focus of infection existed there, except one, the sister of the Drs. Aintree. This case, the only woman who so far has been reported as a positive case of yellow fever, brushes and otherwise cares for the clothing of her brothers, one of whom has been in very intimate contact with many patients.

From the first bunch of patients, four from October 3 to 6 (three of whom, however, are doubtful), there is one case on the 11th (positive), and a hiatus to October 25, after which the occurrence of cases is quite regular, which is not far from what would be expected were their infection derived from those occurring in early October—October 3.

Finally, we note that from the 27th of October all of the cases, positive and suspicious, live in Tampa City, and, save two, have no known communication with the docks; although, of course, they may have, some of them, been there. The exceptions, J. Yeomans and A. Louis, live in Port Tampa City and work at the docks. It is also to be noted that no woman, save the exception given, has been reported as having yellow fever. One was reported "doubtful," sickening on November 10, with one day's fever. Also that, save the cases of J. Yeomans and Albert Louis, who might have contracted their disease either at Port Tampa City or at the docks, there has been no case, positive or suspicious, arising at the docks since October 26, although there is a considerable force (54) of nonimmunes working and residing there. It seems, then, fair to deduce:

(1) That the infection now existing is from the cases developing in early October, although these may be from Welsh.

(2) That the primary focus of infection was about Port Tampa docks—first case there October 4.

(3) That Port Tampa City showed its first infection (apparently in barroom) about (not earlier than) October 27, possibly November 2.

(4) That there is no proof of infection of residences at Port Tampa City so far.

I make this last statement because of the absence of fever among women. The case of Miss Aintree, with the conditions under which it occurred, was most likely from the clothing of her brothers, all three of whom are intimately associated with the fever here. The little girl, Callie Aikens, is doubtful, and a child of that age (9) is sexless and is exposed to the same sources of infection as a boy. I think, then, it is fair to say that the absence of fever among women here shows an absence of infection arising from residences, i. e., that in Port Tampa City it is confined to barrooms, barber shops, etc.—places of masculine resort. It is scarcely to be expected that this will continue, as cases were treated in residences in this place on October 11 and October 25, besides other cases after these dates. If these cases, or, indeed, those occurring in October, infected the premises, it is about time for this infection to be showing by fever developing among their occupants.

The deduction that there is no longer a source of infection about the docks is almost justifiable. It is possible that these docks, or the buildings on them, have never been infected, and that the lump of cases arising there the first part of October may have been from a single exposure, or exposures, covering a few days only, at a focus which then left. This would explain this sudden outbreak of cases all at once, with only two following it, about the docks. I have no data, however, to show that this is the case.

Dr. Weedon, agent of Florida board, has suggested that the case of Welsh was contracted aboard one of the barges in tow of the tug *Lopez*, disinfected by this Service in Habana. These barges were here about this time—arrived August 30. He says that he is informed by a reliable man, whose name he did not give, that Welsh was aboard one of these barges drinking aguardiente; also states that he heard that this barge developed yellow fever en route to Habana. Now, the history of the barges and tug is this: They came over once (possibly twice), and were disinfected and detained at Mullet Key. Then they procured an immune crew and were disinfected by the *Protector*, and came in without detention. It so happens

that they were disinfected by sulphur twice, because there was delay in getting a crew, and they laid over night after their first disinfection and were disinfected a second time. Taking into consideration that they only went to the wharf Regla—a clean wharf, as wharfs go—part of one day, to unload cattle, the chance of these barges, clean from Mullet Key, receiving any save superficial infection, was slight, or rather nil, and there is, counting the double work done on them, no more reason to suspect them than any other vessel which enters from Habana: rather less, think. If this man was aboard one of them, it means nothing. He would go wherever he would get drink, and went on both Plant steam vessels, and doubtless on all the vessels coming to the dock that would let him. If yellow fever developed on board one of them en route to Habana, however, a different aspect is put on the matter, and makes this a probable source of infection, and I have written to Guiteras there to find out. There can be no question but that if one occurred it would be a matter of record at our office. I await his answer.

Pending this, I will to-morrow examine the collector's books for vessels here about that time, August 25 to September 4, and also about the 1st of October, to see if I can get any light on the bunch of cases of early October.

In my experience, and I think that of all, yellow fever is far more apt to be introduced from a place where its existence is not suspected than from one which is guarded against, and as Key West was unquestionably infected from the 1st of August, and before, and no precautions were taken against that port prior to August 30, it would be, to me, most natural to suspect that port as the source of infection. Especially is this true when we recollect that the proportion of infection in Key West was very much greater on August 30, when fever was reported, than in Habana. For instance, of a little over 5,000 passengers from Habana sent to New York up to September 1, none had developed yellow fever within the five days of leaving Habana, while of about 80 who left Key West on September 3, 4 developed yellow fever during the same time, although we winnowed out such as we knew had been exposed to infection, 3 of whom at least developed yellow fever. Key West seems to me, then, the place one would naturally suspect.

It will be difficult to find anything about Key West sailing vessels in port, as such do not enter the custom-house. There were, however, during August three passenger steamers a week and no precautions. Indeed, these vessels should have been—at least their forecastles—disinfected when yellow fever was announced at Key West. The cases of Eppes and Nelson, on October 3 and 11, may have been reinfected anew from this very source, which would explain our inability to trace them from Welsh.

Indeed, considering the communication which these vessels had with Key West prior to the quarantine of that place, it was reasonably to be expected that their forecastles should contain infected articles, which, while not manifesting their infection by producing fever among the immune crew, would be a source of danger to a nonimmune exposed to it.

Members of these crews frequently, or rather habitually, were left over at Key West, the vessel having to ship new men at Habana. I know of no trip in which this was not done. Washing was done at Key West for some of them. New men going aboard in Habana frequently, or rather usually, carried no dunnage, stating that they could buy what they needed in Key West, where clothing of the kind they needed was cheaper. There was of course at this time no bar to getting any clothing or fomites aboard at Key West, and considerable dunnage must have come aboard from Key West while fever prevailed there. Add to this that fever prevailed during this time among the Hebrew population living and sick with yellow fever in their stores, some of them clothing stores, and the chance of getting infected articles aboard was extremely good.

If this be the source of infection, it would explain well why Port Tampa, and not the rest of Florida on this side, received infection, as Tampa people would not

go aboard these vessels in the forecabin; and would explain why the man Welsh would be especially liable to get it.

At the time, then, that Welsh contracted his yellow fever there were vessels at Port Tampa, on which he was frequently aboard, which had been in very intimate and unrestricted communication with Key West, where yellow fever was then prevailing almost in epidemic form. This is so obviously the most probable source of his infection that it simply needs statement.

I hear of no yellow fever in Tampa, and Dr. Weedon says that he is very familiar with the sanitary situation there and that there is none. The mortality last month was 10.8 per 1,000 population, extremely low. I consider the probability of fever in Tampa decidedly lessened, if there be no infection of residences in Port Tampa up to the quarantine. Still the chance of infection being there is considerable. It is too late to do any harm, if reported and treated by disinfection. The risk is, if it exists and is not reported, it may recrudescence next summer. I move to Tampa to-morrow and my address will be Hotel Arno. Weedon is alive to the situation.

Very respectfully,

H. R. CARTER, *Surgeon, M. H. S.*

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure No. 1.]

Extract from letter of Passed Assistant Surgeon Guiteras, at Habana, in answer to mine asking if yellow fever had occurred among the crew of the Guillermo Lopez or her barges.

I can find no record of any. The agent of the company states that none occurred on these barges or the tug last season and that none of their seamen deserted. A case of yellow fever, however, did occur aboard the *Joven Catalina*, which plies coastwise of Cuba, and this may have led to the report you have heard of fever aboard the *Bella Catalina*.

The *Bella Catalina* was one of the barges in the tow of the *Lopez*.

Respectfully,

H. R. CARTER, *Surgeon, M. H. S.*

[Inclosure No. 2.]

List of cases.

[N.—negative; y.—yellow fever; d. y.—doubtful yellow fever.]

Name.	Dates.	Place.
Thos. Edmonds, hospital steward (n.)	Aug. 30—Sept. 4.	Hospital.
John Welsh (y.)	Sept. 4—Sept. 9.	Do.
E. B. Eppes (y.)	Oct. 3—Oct. 12.	The Inn dock.
W. J. Godden, physician at hospital (d. y.)	Oct. 4—Oct. 9.	Hospital dock.
A. S. Cooper (d. y.)	Oct. 5—Oct. 7.	Habana, The Inn.
Pete Burkhart, sick Monday night (d.)	Oct. 6—Oct. 10.	Barkeeper, The Inn.
P. M. Nelson, second time (y.)	Oct. 11—Oct. 14.	Yard, Port Tampa city.
W. W. Harris (y.)	Oct. 25—Oct. 29.	Restaurant, dock.
Miss M. J. Altree (y.)	Oct. 25—Oct. 27.	House, Port Tampa city.
Leonard Lee (d. y.)	Oct. 26—Oct. 30.	Barber, The Inn.
J. H. May (d. y.)	Oct. 27—Oct. 30.	Bar, Port Tampa city.
Cliff. McCune (d. y.)	Oct. 28—Oct. 30.	Do.
Homer Rogers (d. y.)	do.	House, Port Tampa city.
Sammie Yeomans (d. y.)	Oct. 26—Oct. 31.	Do.
Fisherman (n.)	Oct. 30.	Dock.
Mr. Yeomans (d. y.)	Oct. 31—Nov. 1.	House, Port Tampa city.
Callie Aikens, aged 9 (d. y.)	Oct. 30—Nov. 1.	Do.
E. R. Nicks, job laborer, smuggler (y.)	Nov. 2—Nov. 10.	Do.
Albert Louis, dock (y.)	Nov. 4—Nov. 10.	Watch house, Port Tampa city.
Sumpter Barker (y.)	Nov. 5—Nov. 11.	Store, Port Tampa city.
Julian Yeomans, dock (y.)	Nov. 7—Nov. 10.	House, Port Tampa city.
Mrs. Aikens (d. y.)	Nov. 10—Nov. 11.	Do.
J. T. Chivers (d. y.)	Oct. 31—Nov. 2.	Do.

[Supplemental.]

PORT TAMPA, FLA., November 17, 1899.

SIR: In the report on the situation on Port Tampa city, of November 16, mailed this morning, I omitted to say that the diagnosis given are those of the attending physicians. The only cases which could definitely be passed on by myself on their own merits, whether of history or by being able to see them, are the cases of Eppes, October 3, by history; cases of Louis, Baker, and Yeomans, history and personal observation. I believe the diagnosis of the positive cases are correct, but the above statement is necessary that you may have a correct view of the matter.

Respectfully,

H. R. CARTER, *Surgeon, U. S. M. H. S.*

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

INSPECTION ON THE TEXAS-MEXICAN BORDER.

During the year three quarantine stations have been maintained on the Texas-Mexican border, at El Paso, Eagle Pass, and Laredo; and while primarily for the prevention of the introduction of yellow fever, the officers in charge of these stations have been active in the exclusion of smallpox and in assisting the State health authorities of Texas in the eradication of this disease where it had found entry.

The border inspection was conducted under Article XII, Quarantine Regulations, Canadian and Mexican Frontiers, and in conjunction with the inspection carried on within the borders of the Republic of Mexico by officers of this service, as mentioned elsewhere. The inspection of passengers on trains and disinfection of suspected material was a work of considerable magnitude. The prevalence of yellow fever in Mexico made necessary these precautions. No case of the disease was brought over the border.

FLORIDA COAST PATROL, FALL OF 1899.

During the past four years the Bureau has had considerable correspondence with the State health officer of Florida, the customs officers, and with private individuals in the State of Florida, with regard to what may be known as insanitary smuggling on the coasts of Florida on the part of viveros, or fishing smacks, from Cuba, which come to this coast ostensibly to fish for the Cuban markets, but whose occupation, as a matter of fact, consists largely in smuggling rum and tobacco. In 1896 four revenue cutters were detailed for a coast patrol, each cutter carrying a naphtha launch furnished, by the Marine-Hospital Service, and a Marine-Hospital officer. The following year, 1897, a special patrol of medical officers was maintained on each coast of Florida, assisted by the customs inspectors and special agents. In 1898 the blockade of Cuba incident to the Spanish-American war rendered these measures unnecessary; but the matter was again brought to the attention of the Bureau this year by the following correspondence, which also showed the necessity of patrolling particularly the west coast of Florida with a swift, light-draft, and able steamer.

Following are communications received on the subject from the State health officer of Florida:

EXECUTIVE OFFICE, STATE BOARD OF HEALTH OF FLORIDA,

Key West, Fla., June 27, 1899.

DEAR SIR: Reverting to a subject which has been frequently called to your attention—Cuban fishermen on the Florida coast—I desire again to invite your consideration of the subject of prevention of the illicit and illegal intercourse from this class of disease introducers with the sponge fishermen and natives along the western coast of this State.

By reference to your letter files and my correspondence therein, you will be reminded that I have stated that the Revenue-Cutter Service did not prevent smuggling from the class of marine intruders alluded to, and that from the standpoint of a layman and also a health official I could not see that any particular interest was manifested by that service in executing the quarantine laws of the United States. As corroborative of this opinion I referred you to Surg. A. H. Glennan, of your service, who for two summers had peculiar advantage to witness the accuracy and truth of my statements. This reference to the Revenue-Cutter Service seemed, however, to provoke irritation both from your Bureau as well as from that service itself, and my statements were harshly criticised; therefore it is not my purpose now to dwell on "the have beens," but rather to solicit your intervention to prevent now what may become a very serious menace to the health of this State and of the Union unless interrupted and destroyed.

Since the cessation of Spanish-American hostilities the Cuban smacks have frequented the coast (western) of Florida in larger numbers than before the war, and their smuggling has been bolder and, I am informed, more profitable. They follow the sponge fleet of the State from Charlottes Harbor to St. Marks, trading with them and also with the natives along the coast, exchanging rum and tobacco for hogs and groceries. A citizen of Tarpon Springs, which is a little settlement near to Anclote, informed me the other day that these smacks realize more from their illicit trade with the sponge fleet and natives than they do in a "catch" of fish. I am also informed that last year there was quite a deal of sickness on these smacks, the nature of which I could not determine.

To patrol this coast efficiently a swift and safe going sea vessel is essential. I have on more than one occasion recommended the purchase or building of such a vessel by the State board of health of Florida, but the board has never as yet seen its way clear to expend so much money. But until a patrol, untiring in its work, is instituted for the western coast of the State, the clandestine traffic and disease-introducing possibilities will not be corrected.

It has occurred to me that, as your service operates disinfecting plants in many of the ports of Cuba, and notably at Habana and Matanzas, from which ports the larger number of the smacks hail, you could obtain permission from the military government of Cuba to prohibit the passing to sea of these smacks without thorough disinfection and sterilization of the effects of the crew, in which, after all, lies the greater danger. This procedure is recommended to you, with the urgent request that a careful consideration be given to the matter, such as its imperative importance demands.

Very truly,

JOSEPH Y. PORTER.

State Health Officer.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

EXECUTIVE OFFICE, STATE BOARD OF HEALTH OF FLORIDA,

Port Tampa, Fla., July 7, 1899.

DEAR SIR: Your attention having been frequently invited to the danger of illicit traffic and intercourse from smack men from Cuba with the sponge fleet fishing

along this coast and also by trade with natives, which each summer menaces the health of this State through a possibility of introduction of yellow fever and small-pox, it is not deemed advisable nor necessary to again enter into argument contending for an efficient patrol of the coast, as the matter has been so thoroughly discussed heretofore; but I desire to inform you that at a meeting of the State board of health held to-day I was directed to present again the urgent necessity for this coast patrol and to request that you exercise this service on the western coast of this State by the steamer *Dagmar*, under command of an officer of your service. It is understood that the *Dagmar* is at present unemployed, and, as she is of a light draft, is well equipped for this especial work. If you desire to cooperate with the State board of health of Florida in this respect I will be pleased to communicate with you further as to details of the work.

Very truly yours,

JOSEPH Y. PORTER,
State Health Officer

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

In view of the foregoing facts it was early determined to be necessary to purchase a steamer of suitable size for this duty, there being no steamer owned by the Department available. The preliminary work of finding the proper steamer, including an examination by an expert officer of the Service of a number offered for sale, necessarily consumed more time than was desirable, but in August I recommended to you the purchase, at a cost of \$15,000, payable from the epidemic fund, of the steamer *Wapiti*, which was built in Saginaw City, Mich., in 1896, of steel, with the following dimensions: Length, 105 feet on water line; beam, 14 feet 6 inches; depth of hold, 7 feet; draft, 6 feet 2 inches. Her power consists of a triple-expansion engine, with cylinders, respectively, 9 inches, 14 inches, and 23 inches diameter, with a common stroke of 14 inches. Her boiler is a large Roberts with two furnaces, fitted with rocking, shaking, and dumping grate bars. The quarters of the *Wapiti* are admirable, consisting of an after cabin with about 6 feet 6 inches headroom, divided into three compartments separated by sliding doors, and thus capable of being thrown into one or used separately.

Following is my letter requesting the purchase of this vessel:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., August 12, 1899.

SIR: I beg leave to invite your attention to the necessity of a patrol of the Florida coast by a suitable vessel in order to intercept small vessels from Cuba engaged in smuggling and in violation of the quarantine regulations.

This subject has been particularly dwelt upon in the annual reports of this Service for the last three years, and it will be recalled that in the summer of 1896 four revenue cutters were engaged in this work, and the succeeding year it was deemed necessary to have special patrol of medical officers on each coast of Florida, assisted in their work by officers of other branches of the Government service, viz. custom-house inspectors and special agents.

For various reasons these methods are not as effective as is desired, and it is necessary to have a special swift, light-draft vessel for this purpose.

I inclose herewith copies of two letters from the State health officer of Florida, in one of which he transmits a formal request from the board of health of that State for this protection.

I would state that the steamer *Dagmar* is not available for this purpose, being required for use at the Cape Charles Quarantine, particularly during the present outbreak of yellow fever at the National Soldiers' Home and Phoebe. The proposal to purchase the proper kind of vessel has already been considered by the Department, and, in accordance with verbal understanding, I instructed P. A. Surg. H. D. Geddings, who is an expert in the matter of vessels, to inspect several vessels which had been offered for this purpose, as well as for Cuban waters, the purchase of a vessel for Habana being also necessary.

I inclose a copy of Dr. Geddings's report on the steamer *Wapiti*, from which it will be seen that the *Wapiti* is a very desirable vessel for the Department to possess. The agent of this vessel named the price as \$16,000. Believing that it could be purchased for much less, I wired him that if he would make it \$12,000 I would present the matter for your approval. I inclose his response, declining to consider \$12,000, and in reply to my succeeding telegram requesting him to name the lowest sum which he would accept he transmitted a telegram (copy also inclosed) naming the price at \$15,000. This vessel will not only be of service for the work indicated, but is necessary in conjunction with the new quarantine detention camp which is to be erected on Mullet Key. The vessel has been inspected by an engineer of the Revenue-Cutter Service, who reports favorably upon her condition, and I therefore have to recommend that the proposal to furnish this steam vessel at a cost of \$15,000 be accepted, and that I be authorized to consummate the purchase. It would be necessary to supply a new fresh-water tank, at a cost of \$500.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

The SECRETARY OF THE TREASURY.

The *Wapiti* was finally purchased at the price mentioned in my letter, and was renamed, after a deceased officer of the Service, *W. D. Bratton*. Owing to delays, however, caused by suspension of work on repairs and alterations while full inquiry was being made as to the actual value of this vessel, and owing to the work of fitting her up and placing her in commission, she was not ready for duty until October.

In the meantime more letters were received and are on file, showing the great and urgent need of the services of this vessel. Among these letters may be mentioned, without quoting them in full, letters from C. A. St. Armand, of Sarasota, Fla., August 8; E. M. Dunean, of Sanabel, Fla., August 30, and George O. Barnes, September 6, this latter written from Washington and calling attention to the dangerous points on the southern Gulf coast of Florida by reason of smuggling. The following additional letter, with two inclosures, was received from the State health officer of Florida:

STATE BOARD OF HEALTH OF FLORIDA,
Jacksonville, Fla., September 11, 1897.

DEAR SIR: I inclose you a couple of letters relative to the Spanish smack nuisance on the Gulf coast, which are sufficiently self-explanatory.

Much of this clandestine intercourse could be prevented if the revenue cutters for this district would cruise constantly along the coast and not lay up nine-tenths of their time at St. Petersburg and in Port Tampa Harbor.

Very truly, yours,

JOSEPH Y. PORTER,
State Health Officer.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure No. 1.]

SUTHERLAND, FLA., *September 2, 1897.*

GENTLEMEN: I wish to call your attention to the Spanish smacks landing on Hog Key, and it is supposed they are there to dispose of aguardiente.

Parties found a lot of 13 hogs that were carried from mainland, put on Hog Key, and to-day vessels were seen outside at anchor.

Now, this is not the first case where hogs have been taken from the mainland and exchanged, and the stock owners are desirous of getting hold of these parties, and I ask you to cooperate with us and let us see if we can not catch them. I am going to try and get a fund raised and employ a man to watch for these men, and would like your aid.

Please let me know what you can do, and how you can do it.

Respectfully,

THOS. W. HARTLEY.

Hons. S. E. and J. J. HOPE,
Port and Health Inspectors, Anclote, Fla.

[Inclosure No. 2.]

ANCLOTE, FLA., *September 6, 1897.*

DEAR SIR: You can see from inclosed letter that I was right when I reported to you in regard to Spanish smacks having communication with parties on mainland at or near Ozona, Fla.

If I should leave this place and go down there it will leave this place open. I know positively that smacks have had communication down there, and will continue to have unless they are watched.

Please advise me whether I should act down there or not.

Very respectfully,

J. J. HOPE,
Port Sanitary Inspector.

Dr. JOSEPH Y. PORTER,
State Health Officer, Jacksonville, Fla.

The necessity of this vessel was still further impressed upon the Bureau by the following letters from the collector of customs at Cedar Key, Fla., and letters from the Acting Secretary of the Treasury, relating to the violation of the customs laws by these smugglers and providing for the detail of a customs inspector on board of the *Bratton* for the purpose of making seizure of smuggled merchandise and arresting the smugglers:

OFFICE OF THE COLLECTOR OF CUSTOMS,
Port of Cedar Keys, Fla., October 9, 1899.

DEAR SIR: In view of the fact that yellow fever exists at Key West and also that a class of vessels from Key West are engaged in the sponge catch in and about the vicinity of Cedar Keys, St. Marks, and Anclote Key, and that such vessels are in the habit of landing their crews ashore, I thought it advisable to inform your Department of the existing condition, in order that, should you deem it necessary, I should procure a suitable boat and crew for the purpose of assisting the State health authorities in keeping away such vessels, thereby preventing the spreading of yellow fever. The best citizens are alarmed, and think they should be protected through the customs service at this port. This class of vessels can cast along where the revenue cutter can not go, and hence I recommend this be looked after. Awaiting your command, I am,

Very respectfully, yours,

S. P. ANTHONY,
Collector of the District of St. Marks.

The SECRETARY OF THE TREASURY,
Washington, D. C.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., October 13, 1899.

SIR: The Department has received numerous communications from Special Agent Leslie Cullom, then stationed at Tampa, Fla., and from Rev. S. F. Thompson, of Tarpon Springs, Fla., stating that liquors are smuggled extensively at the latter place, and also at Anclote, Clearwater, Punta Gorda, Egmont Key, and other points on the west coast of Florida not named. It appears that Cuban fishing smacks frequent the coast referred to and not only fail to make entry at the custom-house, as required by section 2774 of the Revised Statutes, but furnish spirits in considerable quantities to the crews of American sponging vessels, the latter giving in exchange therefor their supplies. This not only results in loss to the owners of the sponging vessels, but demoralizes their crews, and, in addition, the latter smuggle the liquor so secured into this country.

Mr. W. W. K. Decker, of Tarpon Springs, the owner of sponging vessels, recently called at the Department and made a verbal statement in substance similar to the foregoing, but has not as yet fulfilled his promise to address a letter to the Department upon the subject.

The special agent and his subordinates, who were instructed to investigate these irregularities, reported that they could accomplish little or nothing in the way of preventing them without the aid of a steam launch, and that the revenue cutter on that station is not adapted to work of this character. It is understood that a steam vessel in the employ of your Bureau is about to visit the west coast of Florida to prevent illicit communication between the Cuban fishing and Florida sponging vessels. If this could be accomplished, the smuggling of liquor in the manner referred to would probably cease. If it should be practicable to place a special officer of this Department on board your vessel whenever necessary, it is believed that he could make seizures of smuggled merchandise and arrest the smugglers. An expression of your views upon this subject is requested.

It is proposed, with your concurrence, to instruct Inspector W. M. Browder to cooperate with the master of your vessel in the manner indicated. Inspector Browder is now stationed at Key West and has recently recovered from an attack of yellow fever, but this Department is not able to state how soon under the quarantine regulations he can leave that place.

Respectfully, yours,

O. L. SPAULDING,
Acting Secretary.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., October 18, 1899.

SIR: The Department has received your letter of the 16th instant, relating to the illicit communication between fishing smacks from the Cuban coast and American sponging vessels at points on the west coast of Florida, and stating that a special officer of this Department may be provided with accommodations on board the vessel *Wapiti*, under your control, for the purpose of preventing such irregularities.

Instructions have this day been addressed to Inspector W. M. Browder, through Special Agent C. A. Macatee, directing the former to avail himself of the opportunity thus offered to board the *Wapiti* whenever the exigencies of the service require and the duties of the master of that vessel will not be interfered with. As your letter does not state the present whereabouts of the *Wapiti*, Inspector

Browder has been instructed to ascertain the same by inquiry at the several quarantine stations on the coast of Florida.

Respectfully, yours,

O. L. SPAULDING,
Acting Secretary.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., November 15, 1899.

SIR: I inclose herewith for your information copy of a letter dated the 18th ultimo, addressed to Special Agent C. A. Macatee, containing instructions for the guidance of Special Inspector of Customs W. M. Browder in connection with the alleged smuggling of liquors at Tarpon Springs, Anclote, Clearwater, Punta Gorda, Egmont Key, and other places in Florida.

Respectfully, yours,

O. L. SPAULDING,
Assistant Secretary.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

[Inclosure.]

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., October 18, 1899.

SIR: The Department has received numerous communications from Special Agent Leslie Cullom, then stationed at Tampa, Fla., and from Rev. S. F. Thompson, of Tarpon Springs, Fla., stating that liquors are smuggled extensively at the latter place, and also at Anclote, Clearwater, Punta Gorda, Egmont Key, and other points on the west coast of Florida not named. It appears that Cuban fishing smacks frequent the coast referred to and not only fail to make entry at the custom-house, as required by section 2774 of the Revised Statutes, but furnish spirits in considerable quantities to the crews of American sponging vessels, the latter giving in exchange therefor their supplies. This not only results in loss to the owners of the sponging vessels, but demoralizes their crews, and, in addition, the latter smuggle the liquor so secured into this country.

Mr. W. W. K. Decker, of Tarpon Springs, the owner of sponging vessels, recently called at the Department and made a verbal statement in substance similar to the foregoing, but has not as yet fulfilled his promise to address a letter to the Department upon the subject.

The foregoing facts have been communicated to the Supervising Surgeon-General Marine-Hospital Service, whereupon that officer, in a letter dated the 16th instant, states that a small steam vessel, the *Wapiti*, belonging to the service referred to, has been ordered to the west coast of Florida for the purpose of preventing, so far as possible, the smuggling operations believed to be carried on at that point, and that accommodations thereon for a special officer of this Department will be provided.

You are therefore instructed to direct Inspector W. M. Browder to board the vessel referred to, and, in cooperation with the master thereof, to use all possible and proper means to detect and prevent the irregularities in question. It will not be necessary for Inspector Browder to remain upon the *Wapiti* constantly, but he should make such use of that vessel as the instructions to its commander will permit and the exigencies of the service may seem to require. The result of his operations under these instructions should be duly reported to the Department.

Inspector Browder should make inquiries by telegram at the several quarantine stations at Key West and on the west coast of Florida to ascertain the whereabouts of the *Wapiti* when these instructions are received by him.

Respectfully, yours,

O. L. SPAULDING,
Acting Secretary.

Mr. C. A. MACATEE.

Special Agent, Savannah, Ga.

In accordance with the foregoing understanding, on October 21 I notified the Department that the steamer *Bratton* was then en route to Miami, and the master had been directed to await orders at that point. The operations of this vessel on the west coast of Florida will be narrated in the ensuing annual report, but it is pertinent to state here that they were carried on under the direction of an officer of the service in command of the vessel, but whose legal right to interfere in any way with these fishing smacks, other than to watch and to warn them, might have been questioned, but the customs inspector whom he carried on board had the legal right to seize smuggled merchandise and arrest the smugglers. It may be remarked that since the commissioning of the *Bratton* the smuggling has been practically suppressed, and the presence of this vessel in Florida waters has had the effect of causing the smuggling craft to submit to thorough disinfection in Habana before leaving in order to save themselves from quarantine procedures on arrival off the Florida coast.

SMALLPOX IN THE UNITED STATES.

As shown in a previous portion of this report, under the heading "Division of sanitary reports and statistics," smallpox prevailed during the thirteen months from October 1, 1898, to November 1, 1899, in 37 States, 4 Territories, the District of Columbia, and Porto Rico (512 cases and 26 deaths), with a total for the thirteen months of 10,388 cases and 457 deaths.

As indicating the progress of this disease, it will be of interest to give the statistics taken from previous annual reports, showing its prevalence as reported to this Bureau.

1895.—November 1, 1894, to November 1, 1895 (12 months), smallpox reported in 27 States, 2 Territories, and District of Columbia. Total, 3,347 cases and 633 deaths.

1896.—November 1, 1895, to November 1, 1896 (12 months), smallpox reported in 21 States and 1 Territory. Total, 1,903 cases and 360 deaths.

1897.—November 1, 1896, to November 1, 1897 (12 months), smallpox reported in 16 States and 1 Territory. Total, 371 cases and 33 deaths.

1898.—November 1, 1897, to October 1, 1898 (11 months), smallpox reported in 23 States, 1 Territory, and District of Columbia. Total, 2,641 cases and 27 deaths.

1899.—October 1, 1898, to November 1, 1899 (13 months), smallpox reported in 37 States, 4 Territories, District of Columbia, and Porto Rico. Total, 10,388 cases and 457 deaths.

It should be observed that the statistics as published can not be

considered as accurately determining the amount of smallpox in the United States. The reports of cases to the Bureau by State and local authorities is not legally obligatory, yet in many States the reports from localities to the State board are obligatory, and it may be said, too, that there has been no disposition manifested to withhold reports from the Bureau. While the totals, therefore, given in this report are doubtless below the total number of actual cases and deaths, still they are approximately correct and sufficiently so to show the general status of the disease in each of the States and Territories.

AID IN SUPPRESSION OF SMALLPOX.

As announced in the annual report for 1898, the policy of the Department and the Bureau in assisting State and local authorities in the suppression of smallpox has consisted chiefly in furnishing expert service for the diagnosis of doubtful cases and for instructions to local authorities in the methods to be pursued. As heretofore stated, the suppression of this disease is well understood and so readily accomplished that it is manifestly the duty of communities to care for themselves in this respect and meet all the obligations, pecuniary and otherwise, connected with an outbreak.

The Bureau in rendering its aid has endeavored in every case to do so through the proper State or local health authorities. When called upon, for example, by some prominent citizen in a given locality or some local health officer, the custom has been to refer the matter to the State board of health that the request might come from this board as the proper one with which the Service should deal, the Bureau endeavoring in this manner and by showing this respect to the State health authorities to strengthen the latter in their relations with the local authorities.

Much difficulty has been met by reason of the mildness of the disease and the disposition on this account, even among some physicians, to give it another name. In every instance but one, so far as known, where doubt has been expressed, the doubt has been solved by the Service officers in diagnosing the case as smallpox.

With this disease, as with others of epidemic character, the greater danger attaches to the mild cases so far as the extension of the disease is concerned, and with this disease, as with others, the only safe procedure, and one which should be impressed upon all physicians and health officers, is to treat doubtful cases as though there were no doubt of their being of an epidemic or contagious character.

In two States, namely, Virginia and Georgia, by request of the governor, a medical officer of the Service was detailed for duty under special direction of the governor and placed by the latter on his staff. Under his directions the medical officer then visited all necessary places in the State for diagnosis of cases and demonstrations of the usual methods for suppressing the outbreak.

Wherever the disease has caused concern with regard to the mails, by arrangement with the Post-Office Department the Service has agreed to pay for the material necessary for the disinfection of the mails, the work to be done by the post-office employees according to methods prescribed by the Bureau.

The reports of the officers detailed from time to time for service on account of smallpox in behalf of some fifteen localities in Georgia, Virginia, North Carolina, Texas, Pennsylvania, Maryland, Tennessee, and other States, and the District of Columbia, have been published in the Public Health Reports, and may be found in the bound volumes of said reports for 1898 and 1899. A few of these reports are subjoined to illustrate the character of the work done.

A practical method of aiding in the suppression of this disease, and one that has caused numerous expressions of appreciation, has been the publication of two brief pamphlets, the one entitled "Precis upon the diagnosis and prevention of smallpox," prepared under my direction by a board of officers called for the purpose, the other entitled "A plan of organization for suppression of smallpox in communities not provided with an organized board of health." This pamphlet was prepared by P. A. Surg. C. P. Wertenbaker, who, by reason of his frequent details for smallpox expert duty, appreciated the necessity of information of this character being furnished, particularly to small communities. Both these brochures were published in the Public Health Reports, and in special pamphlet form have been as widely distributed as possible, a large edition having been exhausted during the fiscal year. They are reproduced in this report.

VACCINATION.

Vaccination as a means of suppression of smallpox has proven so efficient that it seems superfluous to call attention to it or urge it as a preventive, yet with the widespread prevalence of smallpox attention must be called to it as the chief personal prophylactic and the main reliance in suppressing outbreaks of the disease in communities. As declared in the precis above referred to, the glycerinized lymph should alone be used. The purity of this form of virus is unquestioned, and the care which is now exercised in its preparation is so great that this, together with the glycerin feature of the virus, assures a freedom from the untoward results which at one time complicated vaccinations. The Bureau has purchased and distributed vaccine for about 20,000 vaccinations during the period covered by this report. There is appended an interesting article upon the value of vaccination, prepared and published by the State health officer of Alabama.

In view of the widespread prevalence of smallpox, orders were issued in January to the medical officers of the Marine-Hospital Service stationed at ports on the Mississippi and Ohio rivers and at Norfolk,

Va., to vaccinate, as far as practicable, the crews of vessels arriving at their respective ports.

The follow instructions were sent in May to the Marine-Hospital officers stationed on the Great Lakes and Atlantic seaboard:

OFFICE OF THE SURGEON-GENERAL, M. H. S.,

Washington, May 4, 1899.

SIR: In view of the prevalence of smallpox in certain ports, it is deemed wise to have the crews of vessels vaccinated so far as practicable. You are directed to make requisition for a sufficient supply of vaccine virus to vaccinate the crews of vessels at your port. While the vaccination can not be made compulsory, you will use every endeavor to persuade the officers and crews to submit to vaccination, either at the Marine-Hospital office or on board the vessel as may be most convenient. Make a weekly report, giving the total number of vaccinations during the week. Give the names of vessels visited for this purpose and the number of the crew on each.

Respectfully, yours,

WALTER WYMAN,
Surgeon-General M. H. S.

To August 31 there were 6,443 vaccinations of crews of vessels on the Great Lakes and Atlantic seaboard, as shown by the following table:

Vaccination reports for the four months ended August 31, 1899.

Station.	Week ended—	Number vaccinated.	Station.	Week ended—	Number vaccinated.
Baltimore, Md	May 27	125	Cleveland, Ohio	May 20	435
Boston, Mass	May 20	6	Do	May 27	442
Do	June 10	6	Do	June 3	280
Do	June 17	5	Do	June 10	136
Do	June 24	42	Do	June 17	109
Do	July 1	22	Do	June 24	62
Do	July 8	2	Do	June 30	22
Total		83	Total		1,617
Buffalo, N. Y.	May 13	65	Detroit, Mich	May 20	36
Do	May 20	291	Do	May 27	0
Do	May 27	249	Total		36
Do	June 3	306	Duluth, Minn	May 20	15
Do	June 10	196	Erie, Pa	do ..	88
Do	June 17	171	Milwaukee, Wis.	May 27	82
Do	June 24	98	Do	June 7-17	85
Do	July 1	55	Total		167
Do	July 8	24	New York, N. Y.	May 29	48
Do	July 15	20	Do	June 10	31
Do	July 22	29	Do	June 17	38
Do	July 29	33	Do	June 24	23
Do	Aug. 5	26	Do	July 1	57
Do	Aug. 12	26	Do	July 8	20
Do	Aug. 19	24	Do	July 15	27
Do	Aug. 26	24	Do	July 24	195
Total		1,637	Do	July 29	144
Charleston, S. C	May 31 ¹	17	Total		556
Do	June 7	4	Savannah, Ga	June 17	20
Total		21	Do	June 24	3
Chicago, Ill	May 22	615	Do	July 1	17
Do	May 29	478	Do	July 8	16
Do	June 5	460	Do	July 15	36
Do	June 12	300	Do	July 22	29
Do	June 15 ²	124	Total		121
Total		1,977			
Cleveland, Ohio	May 13	131			

¹ Period to.

² Three days.

MEASURES TO SUPPRESS SMALLPOX IN THE SOUTHEASTERN PORTION OF VIRGINIA,

The Bureau having received information that while the authorities of Norfolk, Portsmouth, and Newport News were using proper measures to suppress the outbreak of smallpox in those cities, necessary measures were not being taken in the contiguous districts. P. A. Surg. C. P. Wertenbaker was directed to visit these districts and to make full report upon the situation. Upon investigation he found the conditions sufficiently serious to warrant his visiting Richmond for conference with the State board of health and the governor, and by request of the latter, in conformity with the expressed desires of the State board of health, Dr. Wertenbaker was ordered to report to the governor for duty in connection with measures being taken by the State authorities for suppressing the disease.

Following is the letter of instructions to Dr. Wertenbaker:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., April 21, 1899.

SIR: By request of Hon. J. Hoge Tyler, governor of Virginia, you are hereby detailed, by direction of the Secretary of the Treasury, for special duty in connection with the prevailing smallpox in Virginia, and will report to the governor for the purpose of rendering such assistance as may be requested by him or by the State board of health, on whose suggestion the request for your detail has been made.

You will keep the Bureau thoroughly informed of your transactions and make such recommendations to the governor or to the State board as may seem to you advisable.

You are informed that preliminary measures have been taken for regaining the control of Craney Island by the Service, and you will be notified as soon as the Service becomes in possession of that island and will be prepared to make such recommendations concerning its use by the State or local authorities as may seem to you advisable.

It is desired that the State and municipal authorities should eliminate smallpox from the State of Virginia as soon as possible.

You will render your pay and traveling expense accounts in the usual manner to the Bureau. Report transactions once a week or oftener, and at the close of your duty make full written report.

You will wire the Bureau when your services are no longer needed, when orders will be sent directing return to your station.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General U. S. M. H. S.

C. P. WERTENBAKER,
Passed Assistant Surgeon, U. S. M. H. S.

REPORT OF P. A. SURG. C. P. WERTENBAKER ON THE SMALLPOX SITUATION IN
SOUTHEAST VIRGINIA.

NORFOLK, VA., *April 30, 1899.*

SIR: I have the honor to make the following report of my transactions while on special duty in connection with smallpox in Virginia, for the week ended April 29, 1899. I reported for duty to Governor J. Hoge Tyler, at Richmond, Va., April 22, 1899. I was assigned to duty with the governor's staff, and directed to confer with the State board of health, and to visit such places in the State as I saw fit. After conference with the executive committee of the State board, it was determined that I should visit Warwick County first. The governor sent a request to

each of the three supervisors of Warwick County to meet Dr. Paulus A. Irving, secretary of the State board of health, and myself, at the Warwick Hotel, at Newport News, at noon on April 26. At that hour two of the supervisors, S. A. Morse, a colored man, and C. H. Burnham, a white man, met us for a discussion of the smallpox situation. Dr. J. R. Bagby, president of the Newport News board of health, was also present. We made a statement of the conditions existing in Warwick County, showing that smallpox cases were unrestrained, and that no efforts were being made to stop its spread; that these cases were constantly coming into Newport News and adjacent cities, keeping up the infection in those places. We explained the necessity for stamping out the disease at once and restricting its further spread. Our astonishment can better be imagined than described when S. A. Morse, the colored member of the board of supervisors, who seemed to be the spokesman, informed us that the supervisors did not consider the disease smallpox; that in their opinion vaccination, instead of protecting against the disease, increased its virulence, but that under any circumstances the board did not propose to take any action whatsoever, that nothing was now being done, and nothing would be done by their board. No arguments could shake them from their position; therefore, the secretary of the State board informed them that it would be necessary to quarantine the entire county, including Newport News, and I stated that I would recommend that the city and county be declared as infected, and be quarantined against.

The supervisors expressed their incredulity and disbelief that we could do anything of the kind, and the conference was at an end. Realizing the detriment a quarantine would be to the growing city of Newport News and the various large interests centered there, we determined to consult with the city authorities to see if they could not take some action for the purpose of stopping the spread of the disease in the county. With the prospects of a close quarantine before them, the city authorities determined to overstep their legal authority and take charge of all the cases in the immediate vicinity of the city. The cases are to be removed to the pesthouse, and isolation of suspects and disinfection of houses, etc., to be done as in the city proper. With this agreement on the part of the city people we left, but I am to return to make inspection of the methods used and supervise the work. I hope to be able to make this visit early next week. The conditions in the county are at present unknown, as no inspection has been made. The colored supervisor, S. A. Morse, bears marks on his face of recently having had the disease. I am informed that he keeps a country store and that he attended his store while broken out with eruption. If this is the case, he has doubtless spread the disease among his customers, and it is hard to estimate the extent of the infection, as no precautions whatsoever have been taken, no isolation of cases or disinfection of houses. It will be seen that the conditions are about as bad as it is possible for them to be. I arrived at Norfolk the same evening, and on Thursday, 27th instant, I visited and inspected Craney Island, in accordance with your verbal instructions. I inclose herewith a separate report on Craney Island. On Friday I visited Berkley and saw one of the supervisors of Norfolk County and arranged with him to have the supervisors meet Dr. Irving and myself in Portsmouth on Monday next, May 1, for a conference on the smallpox situation. The supervisor that I saw, Mr. Tilley, seemed to think that his board would be willing to take any action that we would recommend for the suppression of smallpox. I am informed that smallpox has appeared in Isle of Wight County and at Roanoke, Va. I will also visit these places if necessary. With the exceptions of Warwick County and Norfolk County, where the conditions are unqualifiedly bad, the conditions in the cities seem to be improving. I have been furnished the following report:

Norfolk, April 29, 1899:	
Cases in pesthouse	53
Case in city (guarded)	1
Suspects isolated	51
New cases during last seven days	18
Total cases to date	891
Berkley, April 27, 1899:	
Cases in city	12
New cases in city in past seven days	8
All negro cases sent to county pesthouse.	
Portsmouth, April 29, 1899:	
In pesthouse	45
New cases during last seven days	15
Total cases to date	272
Newport News, April 25, 1899:	
In pesthouse	69
In city (guarded)	3
New cases in last seven days	13
Norfolk County. Health officer reports under date of April 24, 1899; first case reported March 12, 1898:	
Number of cases to date, about	1,200
Number of cases in county at present	299
Deaths	39
Population, 50,000; 50 per cent vaccinated.	
Elizabeth City County, including Hampton, April 19, 1899; first case reported January 10, 1899:	
Number of cases to date	110
Deaths	0
Total cases in city and county at present	3
Respectfully, yours,	

C. P. WERTENBAKER,

Passed Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

MEASURES TO PREVENT EXTENSION OF SMALLPOX FROM ALEXANDRIA, VA., TO WASHINGTON, D. C.

The following request from the Commissioners of the District of Columbia was complied with, and the measures taken, together with the conditions which were to be met, are sufficiently indicated in the report of Sanitary Inspector Snowden, which follows:

OFFICE COMMISSIONERS OF DISTRICT OF COLUMBIA,

Washington, D. C., January 18, 1899.

DEAR SIR: The Commissioners have the honor to request that you will establish such inspection service as will tend to prevent cases of smallpox from finding their way into the District of Columbia from Virginia.

The Commissioners are officially advised that there are at present ten cases of this disease in Alexandria, and that it is prevalent at Norfolk. It is suggested that an inspection of passengers as they go aboard the steamers and trains, with a view to excluding any who may be infected, would be of material assistance in

preventing the spread of the disease to this place, and the Commissioners hope that you may find it possible to take prompt action in the matter.

Very respectfully,

JOHN B. WIGHT,

President Board of Commissioners District of Columbia,

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF SMALLPOX EPIDEMIC IN ALEXANDRIA, VA., AND MEASURES TO
PROTECT WASHINGTON, D. C.

ALEXANDRIA, VA., *April 30, 1899.*

SIR: I have the honor to send the following report of the smallpox epidemic in Alexandria:

The first case was reported December 27, 1898, and was thought to have been contracted from a shipment of rags from Norfolk, Va. This was disproved later, and it is now thought there were 2 cases here the last week in November. The second case was reported December 29. On January 24 there were 21 cases, and on the 28th 47 cases. The daily increase from January 28 until February 11 was from 5 to 19 cases, making a total February 11 of 213, the number growing until 352 cases had been reported—47 whites, 305 blacks, with 5 deaths—all black—9 confluent and none hemorrhagic. Number sent to the pesthouse, 21.

The history of the epidemic is interesting, first, because of the mild type of the disease, which was early mistaken for chicken pox, and, secondly, because the health officer was handicapped by the municipal authorities, who misled the public by stating in the proceedings of their council there was no smallpox in the city, hoping by concealment to meet the approbation of the wholesale merchants, not knowing the inevitable outcome of such a course is the wide spreading of so contagious a disease. Even after the mayor had requested you to send an expert here, and Dr. Rosenau had pronounced every one of the 19 cases he saw smallpox, there were articles published in the daily press denouncing physicians who advocated compulsory vaccination and closing the public schools and places of amusement as "calamity howlers." The authorities finally had a house-to-house inspection, without vaccination, which unearthed a few cases. The differences between the mayor and the health officer were now so great that the council appointed a committee of five to look into the matter, examine witnesses, and make a report. A report (unanimous) from the committee for compulsory vaccination was defeated by a unanimous vote in the council, the committee without exception voting against its own report. The mayor then had four policemen vaccinate the indigent who made no objection. The health officer, with the concurrence of the board of health, made a contract with six physicians to make a reinspection and vaccinate those willing at the city's expense. A new pesthouse was now built, in which one patient was put, thereby rendering it unfit for use as a house of detention, which had been urged. Patients, though indigent, were allowed to remain where found, instead of isolating them from the inmates of their homes, and the whole family fed at the corporation's expense. In one instance, where a case of varioloid had recovered, the mayor advised the head of the house to forcibly eject the fumigator if sent there by the health officer. This resulted in the house never being disinfected.

The quarantine was a farce, inmates of flagged houses coming and going at will, and I saw a smallpox patient putting away coal dumped at his front door at the expense of the city, and it was no uncommon sight to see them at their windows and doors. After the reinspection and vaccination (about 10,000 vaccinations, this estimate made on the number of vaccine tubes sold by druggists) there was a

marked decrease. At this date there is one convalescent to be discharged in a few days.

By your order, January 26, an inspection by seven physicians of all trains, steam and electric, and boats going to Washington was put on, and the good accomplished will be seen when my reports show one man removed from the electric train died at the pesthouse two days after; another man found traveling between Washington and Alexandria sent to the pesthouse. In all, some 30 suspects and persons known to have been in contact with the disease were prevented from traveling, and innumerable baskets and bundles of soiled laundry were prohibited from going to Washington.

Yours, respectfully,

ARTHUR SNOWDEN,
Sanitary Inspector, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

MEASURES TO PREVENT THE SPREAD OF SMALLPOX IN GEORGIA.

WILMINGTON, N. C., *February 26, 1899.*

SIR: In obedience to your instructions, I reported to the Hon. A. D. Candler, governor of Georgia, at Atlanta, on February 6, 1899. I was detailed by the governor as a special aid on his staff and assigned to the supervision of all health matters in the State. There is no State board of health in Georgia, and all health matters are in the hands of the county authorities, with the exception of the larger cities and towns where there are local boards of health.

The administration of county affairs varies in the different counties; in a majority of them the probate judge, under the title of "ordinary," has entire charge; in some counties a board of county commissioners, and in others a commissioner of roads and revenue is responsible for all county matters. In a few of the counties a physician is regularly employed to treat the sick in the jail or almshouse, but they do not attend contagious diseases outside of those institutions except by special agreement. From the above it will be seen that there exists no general health organization in the State or counties; therefore the governor requested the detail of an officer of the United States Marine-Hospital Service to serve on his staff, and under his direction to act as the health officer for the State, with special reference to the outbreak of smallpox in several localities. I was furnished the following communication for presentation to the local authorities as my commission:

"EXECUTIVE OFFICE,

Atlanta, Ga., February 8, 1899.

"To the ordinaries and county commissioners of Georgia:

"Owing to the prevalence of smallpox in a number of counties in the State, and there being in Georgia no State board of health, and being anxious to aid the local authorities in stamping out the disease as quickly as possible, I called on the Surgeon-General of the United States Marine-Hospital Service to detail a medical officer skilled in the treatment of the disease and have him report to me for duty on my staff. In response to my request the Surgeon-General has sent the bearer hereof, Dr. C. P. Wertenbaker, who goes to your county, not to take control, but to cooperate with the local authorities and advise them how best to treat and most effectually to arrest the spread of the disease. I commend Dr. C. P. Wertenbaker to county and city authorities who are contending with smallpox, and urge them to avail themselves of the valuable aid he can, from his professional skill and experience in handling this disease, render them and their local physicians. He bears the commission of the United States, but he comes to you as the representative of the State government, not to supplant but to aid you.

"ALLEN D. CANDLER, Governor."

Armed with this letter, I visited a number of localities in the State where smallpox was prevailing and rendered such aid and advice as was possible to the local authorities. In order to ascertain as quickly as possible the location and extent of the disease and other data, the following circular was issued and sent to each county and larger city in the State:

“EXECUTIVE OFFICE,

“*Atlanta, Ga., February 9, 1899.*

“*To the ordinaries, county commissioners, and local health authorities:*

“In view of the prevalence of smallpox in a number of counties in the State, it is desired, in order to suppress the disease and prevent its spread, to have accurate information as to the condition in each county and city in the State. You are requested to furnish the following information at the earliest possible moment, and thereafter make a weekly report as to the condition in your county or city:

“(1) Does smallpox exist in your county or city?

“(2) If so, how long has it existed?

“(3) How many cases have there been, and how many now?

“(4) Give the localities, with numbers of cases in each.

“(5) Is the disease chiefly among the whites or blacks?

“(6) What is being done to suppress it? State in detail the methods that are being used.

“(7) Is the disease spreading?

“(8) Does chicken pox or any other contagious or infectious disease exist? If so, give localities, number of cases, and other details.

“Address your communications to Dr. C. P. WERTENBAKER, *Passed Assistant Surgeon, U. S. M. H. S., Special Aide, Adjutant-General's Office, Atlanta, Ga.*

“In case of doubt as to the nature of any eruptive disease, you are requested to isolate the case until the diagnosis can be determined. If desired, an expert in the diagnosis of smallpox will be sent to render you such aid as may be necessary.

“Very truly, yours,

“A. D. CANDLER, *Governor.*”

There are 137 counties in the State, and most of them sent prompt replies. It was learned that smallpox either then existed, or had existed a short time previously, in the following counties: Baldwin, Bibb, Coweta, Decatur, Dekalb, Jasper, Jones, Putnam, Richmond, Terrell, and Washington. The reports showed that the disease was chiefly confined to the negroes, that it was a mild type, and but few deaths had occurred; that the disease was not spreading; that chicken pox and measles were prevalent in a number of localities, but chiefly among children. The newspapers reported several cases of epidemic cerebro-spinal meningitis at Albany, Ga., but no report to this effect was received from the authorities. In all the counties except Jones, Jasper, Putnam, and Dekalb, the smallpox was confined to a few persons, and they had been promptly isolated and other precautions taken to prevent the spread of the disease. In the excepted counties the disease was at first confined to the negroes living out in the country, and as the disease was so mild, no physician was called, or the disease was not recognized as smallpox, and consequently no efforts were made to prevent its spread until it had infected a large area. This was particularly true in Jones County, where the disease had existed, unrecognized, for some thirteen months before my visit on January 16, 1899. After that visit the county authorities adopted the suggestions made to them at that time, and within thirty days thereafter the disease was reported to be under control. It had been the purpose of the governor to have me visit each of the infected localities in the State and inspect the methods in use for the suppression of the disease, but owing to the extremely inclement weather, and the fact that the country roads that had been recently repaired were practically impassable, this purpose was abandoned.

By direction of the governor I visited Lithonia, in Dekalb County; Grantville, in Coweta County; Vienna, in Dooly County, and Sandersville and Tennille, in Washington County, diagnosed the disease at or near those places, and advised with the authorities as to its suppression, and the protection of localities where the disease had not made its appearance. The measures suggested were usually promptly adopted. A copy of the *précis* on smallpox issued by the Service was sent to each county, and proved of great assistance to the authorities, and requests for additional copies were frequently received. As the supply was exhausted, and the additional copies requested not having been received from the Bureau, the following circular was prepared and sent to the authorities in each infected locality in lieu of the *précis*:¹

“EXECUTIVE OFFICE,

“*Atlanta, Ga., February 15, 1899.*

“*To the ordinaries, county commissioners, and local health authorities:*

“Your attention is called to the necessity for careful disinfection of houses and articles that have been exposed to infection from smallpox.

“The recurrence of the disease, after it has been apparently suppressed, is frequently due to a lack of thoroughness in the disinfection of the patient, the house, and infected articles.

“The following methods are recommended:

“(1) *Disinfection of the patient.*—No patient should be discharged until after all scaling of the skin has ceased. Bathe the patient daily for several days previous to discharge. On the day before the patient is to be discharged, take the suit of clothes that he has been wearing, if he has no other suit, and dip it in a 1:1000 solution of bichloride of mercury and dry in the sun, the patient wearing in the meantime a suit of ‘overalls.’ On the day of discharge require the patient to go some distance from the infected house and there take a bath followed by a bath of bichloride of mercury (1:1000), after which he can put on his disinfected clothes and be discharged. Especial care should be taken that the hair is thoroughly washed, especially in the case of negroes.

“(2) *Disinfection of articles.*—(a) Mattresses, pillows, quilts, and other articles that cannot be readily disinfected should be burned.

“(b) All articles that will stand boiling should be boiled for at least one hour. A handful of washing soda should be put in the water in which the clothes are boiled. After boiling, the clothes should be rinsed in clean water and dried in the sun.

“(c) Articles that can not be boiled should be dipped in a solution of bichloride of mercury (1:1000) and dried in the sun.

“(d) The furniture should be thoroughly washed down with the bichloride solution.

“*Disinfection of the house.*—If the house is of but small value, it should be burned; otherwise it should be disinfected by one of the following methods:

“If the house is close and will retain the gas, it can be disinfected by either formaldehyd or sulphur dioxide. If it is too open to admit of disinfection by this means, it must be washed down with a solution of bichloride of mercury 1-1,000.

“(a) *Disinfection by formaldehyd.*—All openings, and especially those around windows and doors and the fireplace, should be closed by stuffing with cotton or some similar material, or by pasting paper over the cracks. The formaldehyd is usually introduced through the keyhole of the door in amount equal to 4 per cent of the volume of the air in the room, and the room left closed for not less than six hours. As formaldehyd requires the use of a generator, it will probably be more convenient, generally, to use sulphur.

¹ The *précis* requested were sent, but not received.

“(b) *Disinfection by sulphur*.—Close house as above, with the exception of one door, for each room to be disinfected, and in each put a tub of water; in each tub put an iron pot capable of containing double the amount of sulphur required. Put in each pot sulphur enough to give 5 pounds for each 1,000 cubic feet of air space. Pour on a small amount of alcohol; see that the sulphur is thoroughly ignited, then leave the room; close the door and stop all the cracks. Leave the room closed for twenty-four hours.

“(c) *Disinfection by bichloride of mercury solution*.—If the house is too open to admit of disinfection by the above-mentioned gases, it must be thoroughly washed down with a solution of bichloride of mercury 1-1,000. Every portion of the room should be thoroughly wetted with the solution, and the room should not be occupied for twenty-four hours. The doors and windows should be kept open to facilitate drying.

“For further information in regard to disinfection, and also the diagnosis, care, and treatment of the disease, you are referred to the précis on smallpox, issued by the United States Marine-Hospital Service, copies of which will be sent on application.

“By order of the governor:

“C. P. WERTENBAKER,

“*Passed Assistant Surgeon, U. S. M. H. S.,*

“*Special Aid to the Governor.*”

By February 20 the reports from the infected localities were so favorable that it was thought that my services would be no longer needed, so I was relieved, and rejoined my station. The following extracts from one of the reports received will give a fair idea of the tenor of the reports: “At the last meeting of the county commissioners, there were 16 cases still in quarantine; all in fair condition, and all expected to recover; since that time (February 6) all of said cases have been discharged, though a final report of the physicians in charge has not been rendered. Disease has existed since December 1, 1898, and has been chiefly among the negroes. There is no spread. No knowledge of any other contagious or infectious disease in the county. The fight against smallpox in this county has been prompt, efficient, and successful, and unless it is again brought into the county there is no danger of another outbreak. Houses have been fumigated, and, where necessary, burned.”

It must not be supposed, however, that the disease has been eradicated from the State. There will be new cases appearing from time to time in different localities, and the situation will require careful watching on the part of the local authorities. Their attention having been called to the situation, many of the counties are now keeping a careful lookout for the disease, and have made preparations for taking care of it, in case it makes its appearance. With this attitude on the part of the county authorities, it would appear that the spread of the disease should be very soon stopped. I am gratified to be able to report that the use of glycerized lymph for vaccinating has been most satisfactory. From all reports that I have received, and according to my own experience, the lymph is “taking” well, and there is almost a total absence of the greatly inflamed arms following vaccination that proved such an obstacle in the path of the health authorities during the past two years.

Respectfully, yours,

C. P. WERTENBAKER,

Passed Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REVIEW OF OPERATIONS IN ADVISORY CAPACITY IN SUPPRESSING SMALLPOX
IN GEORGIA.WILMINGTON, N. C., *October 24, 1899.*

SIR: Some months ago you directed me to keep under observation places and sections in the South where smallpox has prevailed during the past year or two, and to report my observations to you from time to time. Being recently in Georgia on special duty, I took advantage of the opportunity thus offered to make inquiry regarding the smallpox conditions existing at present in the State, and particularly those sections that I visited in the earlier part of this year to aid in the suppression of the disease.

In the latter part of January last, I was ordered by you to report in person to the governor of Georgia for the purpose of advising and assisting him in stamping out smallpox in the State. There is no State board of health in Georgia, so I was assigned by the governor to a place on his staff as a special aid, and acted as the chief health officer for the State. In this capacity I visited such places in the State as directed by the governor, where smallpox was prevailing, acting as expert diagnostician in doubtful cases of smallpox, and advising the local authorities as to the methods to be followed for the suppression of the disease.

When, in the course of my recent special duty, I reached Atlanta, I called to pay my respects to his excellency the governor, and he gave me the following information: During the past year smallpox appeared in 30 out of the 137 counties of the State. In many of the counties only a few cases appeared and they were quickly suppressed; in others, however, the disease became widespread, and covered an extended territory. At the present time the smallpox is only known to exist in a few places, chiefly in the southwestern part of the State.

It is very gratifying to learn that wherever I had been, and my advice followed, the suppression of the epidemic had been quickly accomplished. This was notably true of Jones County. Smallpox had existed in this county for over a year previous to my visit last January, and practically nothing had been done to suppress it. My visit aroused the authorities to activity, and it is gratifying to note that within two months after, smallpox was practically eradicated from the county. The same thing was true of other localities. The conditions in the various places mentioned were somewhat as follows: An eruptive disease, so mild in character that it frequently did not confine the patient to bed, and but rarely resulted in death, was prevailing.

It was confined chiefly to the negroes, at first, and many of them recovered without being seen by a physician. In this way the disease became epidemic before it was known. When it was brought to the attention of the physicians, many of them had never seen a case of smallpox, while others recalled the characters of confluent smallpox, seen many years before. The disease was therefore not recognized in many cases, and faulty diagnoses were made.

The local authorities were at times in doubt as to the real character of the disease, but more frequently were disinclined to take any active measures because such action meant the expenditure of money and also because many of the people did not believe the disease to be smallpox and refused to aid the authorities in its suppression. It was under these circumstances that the presence of a medical officer of the Marine-Hospital Service was requested, as it was agreed by all that his diagnosis and advice would be accepted.

My work consisted in determining, first, if smallpox existed in or near that locality: and if so, to advise the authorities and the people as to the methods to be followed for its suppression. With the exception of the larger cities, there are no health organizations in Georgia. The county affairs are managed by an official called the "ordinary," who is generally the judge of the probate court, or else by a board of county commissioners. No provision is made for a county physician or

health officer. It will be seen that the suppression of an outbreak of smallpox in a county would come as a new problem to the local authorities. Many of them are farmers or merchants in small towns, and unfamiliar with matters pertaining to general sanitation and public health. It is herein that the Service has rendered the most useful aid to the people, at a time and in a manner they most needed it.

The value of the work done by the Service at its maritime quarantines, and in suppressing yellow fever is well known and appreciated by the country at large, but the value of the work of the Service as is here mentioned is less known and consequently is less appreciated, though in its way it is quite as useful to the country. I stopped for a few hours in Savannah and had a pleasant interview with Dr. Brunner, the efficient health officer of Savannah. He informs me that there is no smallpox in Savannah at this time, and the disease seems to be eradicated for the present from the counties along the Savannah River, both in Georgia and South Carolina, where it was prevailing last spring.

From my observation and information received at various points in the State I have formed the following conclusions as to the existing smallpox conditions in Georgia: The State is fairly clear of the disease at present, the chief infected locality being a group of counties in the southwestern part of the State, near the Alabama line.

From the fact that smallpox prevailed in so many localities last winter I am of the opinion that there will be a recurrence of the disease in or near those localities this winter. However, as vaccination has been more general during the past year, and as the authorities are more familiar with the disease and the methods for its suppression, I anticipate that there will be fewer outbreaks, and that they will be more quickly suppressed than last year.

I will continue to keep the State under observation, with other places in the South, and will report should occasion demand it.

Respectfully

C. P. WERTENBAKER,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

The following report shows that a regiment of volunteers at San Francisco was on account of smallpox taken care of at the detention camp connected with the quarantine station on Angel Island:

SMALLPOX IN THE THIRTY-FIRST REGIMENT, UNITED STATES VOLUNTEERS, AT
SAN FRANCISCO.

SAN FRANCISCO QUARANTINE STATION,
Angel Island, Cal., September 22, 1899.

SIR: I have the honor to report that smallpox has broken out in the Thirty-first Regiment, United States Volunteers, recently from Louisville, Ky. The regiment, I am informed, arrived here on the 1st, and on the 19th instant a patient sent to the general hospital was found to be suffering with an eruption which was pronounced to be smallpox. The case was isolated. Later 2 other cases were found to have an eruption; these also were sent into the isolation camp.

On recommendation of Colonel Greenleaf, the regiment was sent to the detention camp on Angel Island for further observation. Two cases of fever were detected in the first company sent over, which were isolated. These developed smallpox.

All the regiment has been vaccinated and will be revaccinated from time to time until thoroughly immunized. The same procedure will be carried out at the Presidio.

This regiment, now in quarantine, will be detained for 15 days after the appearance of the last case, when they will be brought over to the station and their

effects disinfected before embarking. This regiment was ready to leave, all the regimental baggage being on board.

I have been requested by General Shafter to disinfect the compartments of the transport *Grant*, in which the regimental baggage was stored, before another regiment goes on board. This will be done as soon as the baggage is unloaded.

Respectfully, yours,

J. J. KINYOUN,
Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

VALUE OF VACCINATION.

[Circular issued by State health officer of Alabama.]

Smallpox, like many other eruptive diseases, is self-protective; that is to say, one attack, with few exceptions, protects from a subsequent attack.

This is believed to be due to an impression upon or change in the vital fluids and tissues of the body, which renders them immune to the same morbid agent.

Upon this principle rests the theory of vaccination; that is, by vaccination an impression similar to, but milder than, that of smallpox is sought to be made upon the system, so as to protect it from an attack of that disease, or, if one should occur, to mitigate the danger and severity of it.

The virus used for vaccinating has been obtained from cows affected by cowpox. The close similarity, or complete identity, of this disease in the cow with smallpox in man has been established in many ways and at various times and places.

Jenner's discovery of the protective power of vaccination was based upon the observation that milkers who became inoculated with the virus of cowpox were not apt to take smallpox, or, if they did, that the severity of the disease was much modified thereby. Blankets used by patients with smallpox have been hung up in barns where cows were kept and cowpox produced, thus proving clearly that smallpox in man and cowpox in the cow are interchangeable diseases.

Formerly vaccination was practiced by introducing into the human system the virus of cowpox, and the effect produced was propagated from one person to another; that is to say, the virus originally taken from the cow was humanized. This practice was believed to be open to the danger of transmitting from person to person other constitutional diseases, and has been abandoned.

Now, bovine virus, or that taken directly from the cow, is used. Farms devoted to the production of this virus have become numerous, the proprietors of which, stimulated by competition, are striving to produce the purest and best article possible.

Before Jenner's great discovery of the protective power of vaccination smallpox was a frequent and fearful disease. What a scourge it was the following quotations, copied from one of the most elaborate and reliable encyclopedic works on medicine ever published, will show:

“For centuries prior to Jenner's discovery of vaccination, in 1798, smallpox had been regarded as the king of fatal diseases. M. de La Condamine says that smallpox was the cause of one-tenth of all the deaths among the human race. Half a million deaths were annually caused in Europe from smallpox prior to the discovery of vaccination. Macaulay says: ‘Smallpox was always present, filling the churchyards with corpses, leaving on those whose lives it spares the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to her lover.’

"In the sixteenth century smallpox fell upon Mexico, and in a few years 3,500,000 of the population yielded up their lives to it, leaving in some places scarcely enough people alive to bury the dead.

"Brazil in 1653 was invaded by smallpox, and in some instances whole races of men were carried to their graves by it.

"The province of Quito in a few years lost 100,000 of her Indian population by this one disease. In 1707 smallpox invaded Iceland and caused the death of 18,000 out of a total population of 50,000. One-sixth part of the inhabitants of Ceylon died of smallpox during one epidemic. Whole tribes of our Indian population were swept out of existence by this disease. In 1734 nearly two-thirds of the population of Greenland was swept away by this disease. Europe, in the century preceding the discovery of vaccination, lost in deaths from smallpox 50,000,000 of her population.

"Enough has been presented to justify Macaulay in calling smallpox 'the most terrible of all the ministers of death.'

"This disease was no respecter of persons. Reaching to the royal throne of France it laid Louis XV in the grave. In Mexico it treated the Emperor similarly. In England it invaded the household of William III, killed his wife Mary, and several others of his family, and would not leave the palace until it had attacked the King and maimed and disfigured him for life.

"Wernher says, in his recent work 'On the Vaccination Question: 'Before the introduction of vaccination smallpox had become a permanent disease, which never entirely ceased in one year, and in every three or five years became a great epidemic. In nonepidemic years one-tenth of all mortality was from smallpox; in epidemic years one-half. Countless mortals who escaped death were maimed by loss of sight. Of new-born children, one-third died of smallpox before their first year; one-half before their fifth year of life. In the country the mortality was greater than it was in the city.'

"Physicians and government possessed no means against this abominable evil.

"Isolation was impracticable from the general widespread nature of the disease. Men accepted the pest as an unavoidable fate. The loss which Europe suffered from this one disease amounted to many millions. It was a principal factor which deterred or kept the population from progress; and to lead us back to these conditions the efforts of many ignorant mortals were directed."

Comparing the present conditions with those just stated, the author goes on to say:

"We now find no child mortality from smallpox among vaccinated children. Also, among adults, whenever vaccination and revaccination are maintained, mortality from smallpox is at an end."

Dr. Jerome Cochran, deceased, one of the foremost and best sanitarians this country ever produced, and for more than twenty years the efficient health officer of this State, wrote as follows:

"The present generation can have, from its own observation, no adequate conception of the terrible devastation which this disease caused before the discovery of vaccination. In the large cities one-third of the deaths of children under ten years of age came from smallpox. Not a decade passed in which this disease did not decimate the inhabitants in one country or another, or over great tracts of country, so that it became more dreaded than the plague.

"In a community or town well and thoroughly vaccinated there would be no possibility of a serious extension of smallpox. Neglect of this protection has, even in recent years, sometimes led to very disastrous and unprofitable results.

"Such a course in Philadelphia in the winter of 1871-72 cost the city many lives and paralyzed business to the extent of \$20,000,000, and such neglect of vaccination in Montreal lately imposed a heavy penalty on that city and its sur-

rounding province and at the same time seriously threatened all adjoining States."

Persons who know the exhaustive and unbiased way in which Dr. Cochran investigated subjects, and the logical methods he pursued in reaching conclusions, will accord great weight to the words just quoted from him. Quotations from medical and nonmedical authors might be continued at great length to show the horrors and fatality of this loathsome disease; but let us turn to a pleasanter phase of the subject and inquire whether there is any remedy. Happily there is, and Dr. Ketchum, of Mobile, a distinguished practitioner of fifty years experience, graphically describes it as follows:

"What the discovery of steam was to the mechanic arts, what the discovery of the printing press was to the world of letters, what the discovery of electricity was to progressive science, what the discovery of chloroform was to the surgeon's practice, such was the discovery of vaccination to the science of medicine and the cause of humanity."

Let us see what this great boon has done:

There died annually from smallpox to every million of inhabitants—

Locality.	Before vaccination.	After vaccination.
Sweden.....	2,050	158
Austria.....	3,005	841
Trieste.....	14,046	182
Moravia.....	5,402	255
Silesia (Austrian).....	5,812	198
Prussia (eastern).....	3,321	56
Berlin.....	3,422	176
Copenhagen.....	3,128	286

In other words, the mortality from smallpox in Copenhagen after the introduction of vaccination was only one-eleventh of what it was before; in Berlin it was but one-twentieth; in Sweden, one-thirteenth.

In Boston in 1721, with a population of 11,000, there were 5,989 cases of smallpox, with 850 deaths; in 1730, with a population of 15,000, there were 4,000 cases of smallpox and 500 deaths.

After the introduction of vaccination there were in Boston from 1811 to 1830, with a greatly increased population, only 14 deaths from this disease, and from 1881 to 1887 only 18. That is to say, in two separate years before the introduction of vaccination there were in Boston 1,350 deaths from smallpox, the population for those years being 11,000 and 15,000, respectively. After the introduction of vaccination, from 1811 to 1830 and from 1881 to 1887, two periods covering twenty-five years, and with a vastly increased population, there was a total of deaths from this disease of only 32.

The figures quoted show beyond dispute that vaccination diminishes to a marked degree both the liability to and the fatality from smallpox. Where, formerly, cases numbered into the thousands or hundreds of thousands they now occur by the hundreds or not at all. In Prussia compulsory vaccination has brought the death rate from smallpox down as low as three-hundredths of 1 per cent, while in countries where vaccination is imperfectly practiced or not at all the disease still goes on disfiguring and killing the inhabitants. The statistics establishing this fact are unassailable, and are open to anyone who chooses to consult them. Could people who refuse vaccination be left to the consequences of their own folly they would incur a penalty that would in time make them wiser, but unfortunately they can not be so left. In bearing the consequences they inevitably inflict them upon others, and their right to do this should be circumscribed.

Some entertain the idea that compliance with hygienic rules is sufficient to furnish exemption from smallpox, but history and current facts abundantly disprove this position. The disease has made its way into some of the cleanest households of the country, and no amount of personal cleanliness will protect one from the poison should he come in contact with it.

W. H. SANDERS, M. D.,

State Health Officer.

MONTGOMERY, ALA., *January 16, 1899.*

PRÉCIS UPON THE DIAGNOSIS AND PREVENTION OF SMALLPOX.

[Prepared in the Marine-Hospital Bureau—First issue January 6, 1899.]

In view of the prevalence of smallpox and the number of inquiries relating thereto, the following précis upon the subject has been prepared in this Bureau under the direction of the Surgeon-General of the Marine-Hospital Service. Smallpox is a disease easily prevented by vaccination, and the preparation of glycerinized vaccine lymph has now been brought to such perfection that there should be no fear of untoward results in its use. The prevention of the spread of smallpox is readily effected by vaccination and other measures, and is properly the care of State and local health authorities. The United States Marine-Hospital Service, upon the request of the health authorities or governor of a State or Territory, is ready to send experienced officers to determine the diagnosis when the latter is in doubt, and to offer such advice as may be necessary as to the preventive measures which should be adopted. As has been the custom hitherto, the Service assistance is limited as above, except under very unusual circumstances, and then only to prevent the spread of the disease from one State into another.

This publication is intended for general distribution, and State or local health officers who have difficulty in impressing upon the authorities or people of their respective localities the necessity of vaccination and other measures to prevent the spread of smallpox, and who desire to be supplied with this précis will be furnished with the same on application to the Bureau.

DEFINITION.

Smallpox is an acute contagious, infectious disease, characterized by an eruption which passes through the stages of macule, papule, vesicle, and pustule, ending in desiccation and desquamation.

ETIOLOGY.

The contagious principle, probably a microbe, has not been discovered, but it is contained in the exhalations of the skin and lungs, and especially in the pustule and dried material following desiccation and desquamation, and may live for months on clothing or furniture. The contagium is tenacious, and may be conveyed by persons and by fomites, such as hair, clothing, paper, letters, furniture, etc., or it may spread through the air by means of the wind blowing the dust containing the virus. The disease is probably contagious during the first four days previous to the appearance of the eruption, but this has not been proved. A few persons seem to possess a natural immunity to the disease. No age, race, sex, or climate is exempt. It attacks the foetus in utero when the mother has the disease. It is more common among the colored races, probably on account of their condition of living in small, crowded rooms, with slight regard for cleanliness. It is worse in cold than in warm weather because of closed houses and aggregation of people.

SYMPTOMS.

True smallpox (variola vera)—Incubation.—The period of incubation varies from seven to twenty days, the average being twelve days. Inoculation, which might occur accidentally in obvious ways, shortens the time to seven or eight days. During this period there are usually no symptoms—sometimes a little malaise or gastric disturbance.

Invasion.—This is sudden, beginning with a chill, which may be followed by others, severe aching in the "small of the back," and sometimes the limbs; intense headache, vomiting, and fever 39.4 to 40° C. (103 to 104° F.). The pulse is rapid and strong. Convulsions may occur in children.

Eruption—Initial rash.—When this occurs it usually appears on the second day in the form of a diffused redness—the scarlatinal form—or of a macular eruption resembling measles. More rarely it may have the form of urticaria. It appears in about 13 per cent of cases (Osler), usually on the inner surface of the thighs, the lateral thoracic regions near the axilla, lower part of the abdomen, and occasionally on the extensor surfaces of the knees and elbows.

Distinctive eruption.—In the discrete or mild form small spots are seen on the third day on the forehead near the hair, around the mouth and on the wrists, and the temperature falls, which up to this time has been continuously high.

The eruption becomes general over the body in twenty-four hours, and at this stage the disease strongly resembles measles. On the fourth and fifth days of the disease the eruption is papular and the characteristic "shotty" sensation is obtained by passing the fingers over the skin. During the next twenty-four hours the papules become vesicles, with clear summits. From the sixth to the eighth day the vesicles change to pustules with a slight depression in the center (umbilicated), each pustule being surrounded by a red border or halo. At the same time the temperature rises again, the secondary fever or *stadium suppurationis* and the general symptoms return. The pustules are especially thick on the face, which is much swollen and disfigured.

About twenty-four hours before its appearance on the skin the eruption develops on the mucous membranes of the respiratory and alimentary tracts, and may be seen on the soft palate, fauces, larynx, and trachea. The inner sides of the thighs and axillary regions, the sites of the initial *rash*, are usually free from the characteristic eruption of smallpox.

Desiccation and desquamation.—After four or five days from their appearance (twelfth or thirteenth of the disease) the pustules begin to dry up. A few days later the scabs begin to fall off, first on the face and later on other parts of the body; the temperature falls to normal and convalescence begins.

Confluent form.—The initial symptoms are more intense, the eruption occurs a little earlier. The papules are discrete but the vesicles and pustules coalesce, especially on the face, hands, and feet, but usually remain discrete on the trunk. The temperature does not fall to the same degree on the appearance of the eruption as in the discrete form, and the secondary fever is higher, more prolonged, and attended by graver constitutional symptoms, such as swelling of the lymphatic glands, salivation, diarrhea, and delirium.

When death occurs it is usually in the stage of maturation, about the tenth or eleventh day. When recovery takes place, the process of desiccation and desquamation is complete in three or four weeks; sometimes it may extend to six or eight weeks.

Hemorrhagic smallpox.—This occurs in two forms:

(a) *Purpura variolosa* (black smallpox), in which the symptoms appear early and death may occur in from two to six days. Symptoms are the same, only more intense, and the eruption appears on the second or third day in the form of a diffuse hyperemic rash with punctiform hemorrhages, especially in the groins.

The rash extends, the hemorrhagic spots increase in size, ecchymoses appear on the conjunctivæ, the skin may have a uniformly purplish hue, and hemorrhages may occur from the eyes, nose, stomach, lungs, urethra, and uterus.

(b) The other hemorrhagic form (*variola hemorrhagica pustulosa*) progresses as in ordinary smallpox to the vesicular or pustular stage, when hemorrhages take place into the pocks or from the mucous membranes. The majority of cases in which bleeding from the mucous membranes takes place die in from seven to nine days. Hemorrhage into the pocks is frequently followed by recovery.

Varioloid.—This is the modified form of smallpox which occurs in persons who have been successfully vaccinated. It is none the less smallpox because of its modified form, and the most virulent form of smallpox may arise from exposure to varioloid.

Symptoms may be severe, with temperature reaching 39.3° C. (103° F.), but usually they are mild. The eruption appears on the third or fourth day and the fever falls at once, and the patient feels comfortable. The papules are few in number, scattered, and may be limited to the face and hands. Vesiculation and suppuration take place rapidly and there is no secondary fever. The eruption does not pass through the regular stages, many of the vesicles disappearing without suppuration, and scars seldom result.

Complications—Respiratory organs.—As a consequence of the eruption on the mucous membranes, laryngeal ulcerations with perichondritis and œdema of the glottis, bronchitis, lobular, and sometimes lobar pneumonia may occur.

Digestive system.—The eruption in the throat is sometimes followed by purulent otitis, parotitis, and ulceration of the pharynx. The spleen is nearly always enlarged, and often the liver.

Circulatory system.—Except the slight degeneration of the muscular fiber, pathological changes in the heart are rare. Pericarditis sometimes occurs, and occasionally endocarditis.

Nervous system.—Convulsions frequently occur in children, and delirium in adults which may end in fatal coma. Post-febrile insanity and occasionally epilepsy occur during convalescence. Neuritis, as in diphtheria, may affect the pharynx, or it may be multiple in the extremities. Hemiplegia and aphasia, the result of encephalitis, rarely occur.

Joints.—Arthritis, which may be suppurative, and necrosis of the bone are sometimes met with.

Skin.—Boils are frequent, acne, ecthyma, and local gangrene sometimes occur, and occasionally after desquamation a secondary eruption resembling smallpox (recurrent smallpox).

Urinary organs.—Albuminuria is not uncommon, but true nephritis is rare.

Special senses.—Catarrhal and purulent conjunctivitis is common in severe cases, leading sometimes to keratitis with ulceration, perforation, and loss of the eye. Iritis and choroiditis may also occur. Otitis media is an occasional complication from extension through the Eustachian tube.

DIAGNOSIS.

The disease must not be mistaken for measles, scarlet fever, chicken pox, impetigo contagiosa, syphilis, cerebro-spinal fever, typhus fever, or glanders. The severity of the attack, the group of symptoms, chill, backache, headache, vomiting, and high fever, 39 to 41° C. (102.2 to 105.8° F.), continuing three or four days and falling on the appearance of the eruption, should excite suspicion of smallpox, especially when this disease is prevalent.

Measles.—In measles, the period of incubation is a little longer than in smallpox—about fourteen days. The stage of invasion more nearly resembles a cold, with shivering rather than a definite chill, sneezing, redness of the eyes, running

at the nose, and cough. The eruption occurs about the fourth or fifth day, and the condition of the patient is not much improved until the sixth day, when the eruption is well developed. By the fifth or sixth day at the latest the diagnosis can be made. The eruption of measles has no tendency to become vesicular, and is only slightly papular.

Scarlet fever.—The period of incubation is much shorter, one to seven days—average four—and the stage of invasion is short, with high temperature and sore throat. The eruption appears early, on the second day, first on the neck and chest and spreads rapidly over the face and body, in the form of a bright red or scarlet rash, like erythema, with a slight tendency to the formation of papules. It gradually fades after two or three days. The tongue has a characteristic appearance—the “strawberry” or “raspberry” tongue, owing to the projection of the enlarged red papillæ through the coating on the tongue. Albuminuria is a common symptom.

Chicken pox—(*Varicella*).—This is more strictly a disease of children, affecting especially those under 6 years of age. The incubation period is rather longer than that of smallpox—ten to fifteen days. The initial symptoms are comparatively mild, with fever, vomiting, and pain in the back and legs. Sometimes convulsions occur in children. The eruption appears during the first twenty-four hours, on the back, chest, or face in the form of red papules, which in a few hours become vesicles filled with a clear or turbid fluid. They are seldom umbilicated, are scattered, more superficial than the vesicles in variola, and the intervening skin is neither inflamed nor hyperemic. In three or four days the eruption dries up into scabs, which soon fall off, leaving little or no scarring. Varioloid may be mistaken for this disease.

[The observation of the Marine-Hospital Bureau has been that in the majority of mistaken diagnoses with regard to smallpox the disease has been called chicken pox. Chicken pox is a contagious disease, and many local health authorities require its isolation. Particularly when smallpox is prevalent, any case of supposed chicken pox should be isolated and guarded as if it were smallpox, at least until the diagnosis is proved beyond doubt.]

Impetigo contagiosa more nearly resembles chicken pox than smallpox. The eruption appears without constitutional symptoms—occasionally there are slight febrile disturbances and malaise coincident with the appearance of the eruption which is found on the face, scalp, hands, fingers, and sometimes the trunk, in the form primarily of small, pinhead-sized vesicles or vesico-papules, flat or slightly raised, and rapidly enlarging into blebs of the size of a split pea or finger nail, containing clear fluid or pus. The eruption occurs in patches or groups as in herpes, the vesicles being at first discrete and usually umbilicated, but later coalescing and as disiccation takes place forming large, crusted patches.

Syphilis.—The eruption of syphilis is sometimes exactly like that of smallpox with umbilicated postules. The history, with the absence or slight character of the fever and other constitutional symptoms, serve to make the differential diagnosis.

Cerebro-spinal fever.—The temperature is usually not so high, extremely severe headache, especially in the back of the head, intolerance of light and sound, strabismus, delirium, coma, and the early appearance of stiffness with pain and contraction of the muscles of the neck and back characterize the disease.

Typhus fever.—In this disease mental symptoms appear early, such as delirium, often maniacal, the temperature rises steadily, usually to the fifth day, when it may reach 41.6° C. (106.08° F.), and the eruption appears about the third to the fifth day, first on the abdomen and chest, rapidly spreading to the extremities and face in the form of a fine irregular, dusky mottling, as if beneath the skin, and distinct papular rose spots, some of which change to petechiæ from hemorrhage.

Glanders.—In glanders the eruption appears on the face and about the joints,

at the same time there is ulceration, swelling, and a mucopurulent discharge from the nose. The period of incubation is short, three or four days.

VACCINATION.

The most efficient means for preventing the spread of smallpox is by vaccination. The protection, provided the virus is pure, is believed to be as complete against contagion as is that of smallpox against a second attack, though not of as long duration, but revaccination, whenever smallpox is prevalent in a community, will continue this protection indefinitely. Therefore the first measure after isolation of a person suffering with smallpox is the immediate vaccination of all persons who have been exposed to the disease, and revaccination in five or six days if there is no indication of the previous virus having been effective.

In order to secure pure vaccine the supply should be obtained from an accredited source, and as bovine virus only is now used the dangers which heretofore existed from arm-to-arm vaccination are eliminated. Glycerinized lymph only should be used.

The operation of vaccinating a person, although fairly well understood, may be briefly described as follows:

Usually the left arm above the middle third is selected, although in some cases the wishes of the person receiving it may be consulted. The part to be vaccinated is bared and the skin rendered antiseptic by means of soap and water and alcohol, after which if a needle or lancet is used, it should first be passed through a flame or sterilized by means of alcohol, and the part scarified in one or more places; the virus is then rubbed in. Of course, it is understood that the same needle shall be used on but one person, and if a lancet is used it should be sterilized for each case. If the vaccination has been successful it will be found that in the course of three or four days a small papule will appear, which soon after becomes vesicular, and is surrounded by a circumscribed areola; this gradually increases until the seventh or eighth day. In the meantime a crust forms, which in due course falls off, leaving the characteristic scar resembling the pits of smallpox, the whole process occupying about three weeks.

Due care should be exercised to prevent the vaccination from being irritated or the "seal" from being broken and to prevent the wound from becoming infected. A vaccine shield is best for this purpose, and it is recommended that either one, provided by the dealers or improvised, be used, but if a vaccine shield is not used care should be taken, as above stated, to prevent the breaking of the "seal" and undue rubbing of the part by the clothing. Adhesive plaster should not be used for this purpose.

In the communities where compulsory vaccination is not required for children going to public schools, it will frequently be found that a large proportion of the pupils, unless an epidemic of the disease has recently occurred, have not been vaccinated, and it is among these that smallpox is more apt to be spread.

A thorough house-to-house inspection, isolation, and vaccination will soon put a stop to the epidemic.

The truth about vaccination.—Dr. Bizzozziro, in a recent lecture delivered at Rome, recalled strikingly to his audience the success of vaccination in Germany. He said: "Germany stands alone in fulfilling in a great measure the demands of hygiene, having in consequence of the calamitous smallpox epidemic of 1870-71 enacted the law of 1874, which makes vaccination obligatory in the first year of life, and revaccination obligatory at the tenth year. What was the result? With a population of 50,000,000, having in 1871 lost 143,000 lives by smallpox, she found by her law of 1874 the mortality diminished so rapidly that to-day the disease numbers only 116 victims a year. These cases, moreover, occur almost exclusively in towns on her frontier. If it were true that a good vaccination does not protect

"from smallpox, we ought to find in smallpox epidemics that the disease diffuses itself in the well vaccinated no less than in nonvaccinated countries. But it is not so. In 1870-71, during the Franco-German war, the two peoples interpenetrated each other, the German having its civil population vaccinated optionally, but its army completely vaccinated, while the French (population and army alike) were vaccinated perfunctorily. Both were attacked by smallpox. The French army numbered 23,000 deaths by it, while the German army had only 278, and in the same tent, breathing the same air, the French wounded were heavily visited by the disease, while the German wounded, having been vaccinated, had not a single case."

HOUSE-TO-HOUSE INSPECTION.

When the disease becomes epidemic a house-to-house inspection is necessary to prevent the spread of smallpox, not only to discover isolated cases, but to vaccinate and to revaccinate all persons who have been exposed to the disease as well as those who have not previously been vaccinated within recent years (say two years). The house-to-house inspection may be advisable before the disease is known to be epidemic.

ISOLATION.

(1) Suspects: Cases of illness suspected of being smallpox or chicken pox should be isolated and kept away from others until the character of the illness is determined. This applies equally to those who have been exposed to smallpox, having a fever at the end of the period of incubation, as to those suffering from an eruption.

(2) Cases: When the character of illness is determined to be smallpox, isolation of the patient should be continued so that there will be no danger of the disease spreading from the case. Isolation is best accomplished in places specially prepared for the purpose. A hospital or lazaretto for smallpox should be located at least 2,000 feet distant from, and to leeward of, habitations—prevailing winds being considered. It is possible under the most favorable circumstances to isolate a smallpox case in a house or residence, but it is not to be recommended. Accidents usually attendant on such isolation are responsible for new foci of the disease among the adjacent residents.

(3) Provisions for treatment of cases: On removal of cases to a hospital or lazaretto, ample provision should be made for their care and treatment, and the patients should be provided with as many comforts as possible. In fact, these comforts are required by reason of the nature of the disease, and neglect of proper care will result fatally.

Cases of varioloid, or smallpox modified by vaccination, should always be treated in the same manner as the virulent type; these cases are equally as dangerous, if not more so, from a sanitary standpoint.

As soon as a case of smallpox has been removed from a house or apartment immediate steps should be taken to prevent the spread of the disease through these agencies. A disinfection of all infected material should be done at once. Those persons who have been in direct contact with the case, or have been exposed to the infection otherwise, should be immediately vaccinated, unless they have been protected by a recent successful vaccination, or have had the disease.

Persons who have been exposed to the disease should be considered under two classes—

(1) Those who have been exposed but once to the infection and are immediately vaccinated. These should be kept under observation until there are unmistakable evidences of the success of vaccination, when they can be discharged from further surveillance.

(2) Persons who have been exposed to smallpox and several days (over four)

have elapsed before vaccination. These should be kept under observation until the period of incubation has passed. The period of incubation should be considered to date from the time of vaccination. The protective effects of vaccination in these cases are of doubtful value.

Persons who have been exposed to smallpox should be kept under the observation of a physician who should inspect them at least once daily during the period of incubation. These persons are not infectious until after the initial fever appears, and then slightly so in the first forty-eight hours—that is to say, before the eruption makes its appearance on the mucous membrane and skin.

Suspects should be kept under observation. Under certain circumstances this may best be done by segregating them in observation camps or hospitals. Under other circumstances it may be done by surveillance at their residences.

Cases of smallpox under treatment should not be discharged until the process of desquamation is complete. This is variable, depending entirely on the case. A safe rule is to await the disappearance of the peculiar red specks at the bottom of the pits or scars. So long as this condition is present, desquamation is going on.

On the termination of the case in recovery, the patient should be given an antiseptic bath—1-1,000 bichloride of mercury—followed by a second bath of water, and then provided with sterile clothing.

Cases dead of the disease should be encased in sheets saturated with a strong antiseptic, preferably bichloride of mercury 1-500, inclosed in a metallic casket hermetically sealed and immediately buried. Cremation is also recommended. It is needless to add, funerals, public or private, are interdicted.

DISINFECTION.

The measures to be put in practice for disinfection are the same in general as those applicable to other infectious diseases, and may be considered under the following:

- (1) Disinfection of infected premises.
- (2) Disinfection of the person and his belongings.
- (3) Disinfection of vehicles.
- (4) Disinfection of merchandise.
- (5) Disinfection of the mails.

Premises.—On the removal of a patient from a house or apartment it is always best to have the contents of the room remain in situ while a preliminary disinfection is given. The object of this is to reduce the danger in handling the infected articles preliminary to their final and complete disinfection.

Room and contents.—This may be accomplished by one of the following methods:

(a) By formaldehyde gas in not less than 4 per cent strength for not less than six hours; (b) by exposure to sulphur dioxide for twenty-four hours, 4 pounds of sulphur to each 1,000 cubic feet, plus due allowance made for waste.

At the end of the time specified the apartment and its contents should be arranged for a final disinfection. (a) The room should be made as air tight as possible. (b) Clothing, bedding (exclusive of pillows and mattresses), hangings, and carpets should be so arranged as to permit all surfaces to be freely exposed to the action of the gas, and then exposed to either (1) formaldehyde gas in not less than a 4 per cent per volume strength for not less than twelve hours or by (2) sulphur dioxide for twenty-four hours by burning not less than 4 pounds of sulphur to each 1,000 cubic feet, plus due allowance made for waste.

Disinfection of a room can be also performed by wetting the walls, ceiling, and floor with an efficient germicidal solution.

It is impracticable to thoroughly disinfect feather pillows and feather beds by either formaldehyde or sulphur dioxide. It is recommended that where there is no apparatus for disinfecting fabrics, etc., these should be destroyed by burning.

Where it is practicable to do so it is recommended that clothing, bedding, carpets, articles of furniture, and the like be disinfected by—

(a) Exposure to steam at a temperature of 100 to 102° C. for thirty minutes.

(b) Boiling, the articles to be completely submerged.

(c) Saturation with an efficient germicidal solution.

(d) Thoroughly wetting the surfaces of the article with a 40 per cent aqueous solution of formaldehyde, and confining it in a small closed space for not less than twelve hours (applicable for upholstered furniture). The commercial preparations known as "formol," "formalin," "formalose," are 40 per cent solutions of formaldehyde.

(e) The application of formaldehyde gas in a special apparatus for this purpose.

Disinfection of a person and his belongings.—As previously referred to under the head of isolation, cases recovered from smallpox should be given a bath with an efficient germicide, and especial care should be taken to see that the hair is thoroughly washed, particularly in the case of negroes.

Clothing, bedding, and articles used in the care and treatment of the sick should invariably be disinfected in the manner as outlined or be destroyed by fire.

The dejecta of smallpox patients should be disinfected by bichloride of mercury solution 1-500, carbolic acid solution 1-49, trikresol in solution 1-100, solution of chlorinated lime, or milk of lime.

Infected articles should never be thrown from railway coaches in transit or otherwise, nor should any article of this character be thrown overboard from vessels.

Disinfection of vehicles infected with smallpox should be performed after the following method:

Railway coaches.—For the day coach, dining car, tourist sleeper, parlor car, formaldehyde gas, applied by means of autoclave in a 4 per cent per volume strength, the time of exposure not less than twelve hours.

For Pullman, Wagner, and other sleeping cars.—Formaldehyde gas, applied by means of an autoclave at a 4 per cent per volume strength, the time of exposure not less than twelve hours.

Arrangements of the day coach for disinfection.—All openings of the car should be closed as tightly as possible, especially the ventilators; these are best closed by means of waste. All carpets along the aisles should be laid across the tops of the seats. If the car is provided with sash curtains they should be pulled down and hooked over the windows. The curtains of the seats should be shoved slightly away from the backs so that all the surface can be reached by the gas.

Water-closets, lockers, and storerooms should be opened. All apertures to be closed with waste or some other similar material. The gas should be introduced into the car by one of two ways—by the keyhole in the car door or through the hopper of the water-closet. If the car is badly infected it is always best to give a preliminary disinfection before doing all that has been outlined above. Under these conditions the car is left just as it is, apertures closed, and a strong percentage of gas thrown in and allowed to remain for at least six to eight hours before it is arranged for the final disinfection. This procedure will be sufficient to sterilize the contents and surfaces of the car, and renders this arrangement less dangerous to the operator.

The immigration coach.—If the coach is constructed with a view to easy cleansing, the interior can be given a cleaning with formaldehyde gas in not less than 2 per cent per volume strength, or by sulphur dioxide for twenty-four hours, by burning 4 pounds of sulphur to each 1,000 cubic feet, and after this a mechanical cleansing of the floors and water-closets, to be followed by a thorough douching with a strong disinfecting solution, preferably a solution of bichloride of mercury.

Sleeping cars.—The same general rules apply to these as for the day and immigration coach. The berths must be let down, all pillows taken out from under the seats; the mattresses and pillows so arranged that all surfaces may be thor-

oughly exposed, curtains suspended from the curtain poles: the carpets removed from their fastenings and placed over the back of the seats or suspended by some means in the aisle. The lockers, closets, etc., to be opened. All the articles therein to be arranged so as to be exposed to the gas. Articles of food not hermetically sealed, should, after the completion of the disinfection—that is, after the exposure of the goods—be destroyed.

In most cases it may be necessary to neutralize the formaldehyde gas by ammonia. This can be readily done by sprinkling a sufficient quantity on the floor of the car and allowing it to remain about one hour; about twice the quantity of ammonia should be used for the formaldehyde solution.

Sulphur is not recommended on account of the destructive effect upon fabrics.

Disinfection of merchandise.—As a rule, new merchandise is seldom, if ever, infected, and if so, only the exterior. A surface disinfection is all that is required. The best method is to place the merchandise in a closed space and arrange in such a manner as to allow the free exposure of all the surfaces to the action of the disinfectant and then apply formaldehyde in not less than a 4 per cent per volume strength for not less than six hours, or by sulphur dioxide for twenty-four hours by burning 4 pounds of sulphur to each 1,000 cubic feet.

Disinfection of mails.—(1) By formaldehyde gas in a 40 per cent solution (formalin, formol, or formalose), letters to be placed in closed receptacle, provided with a tight-fitting lid, and sprinkling each layer of letters with the solution. The receptacle should then be closed four hours.

(2) By the application of formalin mixed with some inert substance, such as sawdust or infusorial earth. This mixture to be sprinkled over the letters in a manner similar to that prescribed in the foregoing. The time of exposure to be not less than four hours.

(3) By application of formaldehyde gas evolved from its solutions, by means of an autoclave, the exposure not to be less than four hours; or the application of formaldehyde by means of a special apparatus provided with the means of producing a vacuum. These latter are better adapted where there is a large quantity of mail to be disinfected.

Individual letters can be quickly disinfected by means of a small piece of absorbent paper, moistened with formalin and inserted into the letter.

It is understood that in any of the foregoing methods, letters, etc., should not be put up in packages; newspapers and packages should be opened and spread apart before disinfection.

When it is impracticable to obtain solutions of formaldehyde, mail should be disinfected by exposure to sulphur dioxide in a closed space, made by burning 4 pounds of sulphur to each 1,000 feet of space, the exposure to be not less than twelve hours.

The following extracts are taken from the interstate quarantine regulations, promulgated by the Secretary of the Treasury, September 27, 1894, in accordance with the act of Congress approved February 15, 1893:

Interstate quarantine regulations.

ARTICLE I.—QUARANTINABLE DISEASES.

(1) For the purposes of these regulations the quarantinable diseases are cholera (cholorine), yellow fever, smallpox, typhus fever, leprosy, and plague.

ARTICLE II.—NOTIFICATION.

(1) State and municipal health officers should immediately notify the Supervising Surgeon-General of the United States Marine-Hospital Service by telegraph or by letter of the existence of any of the above-mentioned quarantinable diseases in their respective States or localities.

ARTICLE III.—GENERAL REGULATIONS.

(1) Persons suffering from a quarantinable disease shall be isolated until no longer capable of transmitting the disease to others. Persons exposed to the infection of a quarantinable disease shall be isolated, under observation, for such a period of time as may be necessary to demonstrate their freedom from the disease.

All articles pertaining to such persons, liable to convey infection, shall be disinfected as hereinafter provided.

(2) The apartments occupied by persons suffering from quarantinable disease, and adjoining apartments when deemed infected, together with articles therein, shall be disinfected upon the termination of the disease.

(3) Communication shall not be held with the above-named persons and apartments, except under the direction of a duly qualified officer.

(4) All cases of quarantinable disease, and all cases suspected of belonging to this class, shall be at once reported by the physician in attendance to the proper authorities.

(5) No common carrier shall accept for transportation any person suffering with a quarantinable disease, or any infected article of clothing, bedding, or personal property.

The body of any person who has died of a quarantinable disease shall not be transported save in hermetically sealed coffins, and by the order of the State or local health officer.

(6) In the event of the prevalence of smallpox, all persons exposed to the infection, who are not protected by vaccination or a previous attack of the disease, shall be at once vaccinated or isolated for a period of fourteen days.

* * * * *

ARTICLE V.—DISINFECTION—FOR SMALLPOX.

Apartments infected by smallpox shall be disinfected by one or both of the following methods:

(a) Exposure to sulphur dioxide for twenty-four to forty-eight hours.

(b) Washing with a solution of bichloride of mercury—1-1000, or a 5 per cent solution of pure carbolic acid.

Clothing, bedding, and articles of furniture exposed to the infection of smallpox shall be disinfected by one or more of the following methods:

(a) Exposure to sulphur dioxide for twenty-four to forty-eight hours.

(b) Immersion in a solution of bichloride of mercury—1-1000, or 5 per cent solution of pure carbolic acid.

(c) Exposure to steam at a temperature of 100 to 103° C. for thirty minutes after such temperature is reached.

(d) Boiling for fifteen minutes, the articles to be completely submerged.

[NOTE.—Formaldehyde gas may be used when applicable.]

PLAN OF ORGANIZATION FOR SUPPRESSION OF SMALLPOX IN COMMUNITIES NOT PROVIDED WITH AN ORGANIZED BOARD OF HEALTH.

By P. A. Surg. C. P. WERTENBAKER.

[Supplemental to Marine-Hospital Bureau document "Précis upon the diagnosis and treatment of smallpox," first issue, October 20, 1899.]

The following pages have been written because there seemed to be a need for some such information by local authorities in their efforts to suppress smallpox. In many States, counties, and municipalities there is no health organization, and the details of managing an outbreak of smallpox come to the local authorities as a

new problem. Having no experience in the management of the disease, valuable time and money are wasted by the authorities in trying to perfect an organization for the work. In order to aid such authorities the following suggestions are offered.

The plan herein suggested is intended more particularly for sections where no health organization exists. It is equally applicable to one case or many cases, to a small or a large territory. In either case the machinery and methods are the same, and one case of smallpox requires as careful handling as a thousand cases. In order to successfully suppress smallpox it is necessary to systematize the work, so that no essential point or measure shall be neglected.

The following form of organization having been frequently tested, and proved satisfactory, is recommended with such modifications as the necessities of each community may require. It has frequently been used by officers of the United States Marine-Hospital Service for the suppression of smallpox, and with unflinching success.

It is essential that the entire management of the work of suppressing smallpox in a given territory should be in the hands of one person. This individual should have military authority over all patients, suspects, and persons employed in the work. He should outline all measures and methods, and be responsible for their proper performance. He should therefore have authority to employ and discharge such persons as in his judgment seems best, and to authorize necessary expenditures. He should be designated as the "Officer in charge" of smallpox work, and should receive the fullest support of the authorities.

From the above it will be seen that the person selected as officer in charge should be a man of good judgment, executive ability, and force of character. One who will do his duty without fear or favor, and whose sole object is the prompt suppression of the disease. His character should be above reproach. Fitness for the position should alone determine his selection, and political, social, or personal considerations should have no weight in the matter. It is always preferable to select a physician for this position if practicable. He should be well paid for his work, for his position will be a most trying one, and if he perform his duty faithfully he will earn his pay, whatever it may be.

[The word smallpox should invariably be used—never varioloid, because many persons have an erroneous idea that varioloid is a different disease from smallpox.]

The officer in charge having been selected, he should proceed to organize the following divisions: (1) Headquarters, (2) Inspectors and vaccinators, (3) Smallpox hospital, (4) Suspect camp or detention house, (5) Guards, (6) Disinfecting corps.

HEADQUARTERS.

One or more offices, centrally and conveniently located, should be selected as headquarters. Here some one should be on duty all the time, both day and night. In some of the smaller cities and towns an office in the police headquarters has been used satisfactorily. Some one is usually on duty here at all hours, and can receive and record all messages and reports.

A clerk should be on duty at headquarters at all times to record messages, answer questions, and keep the records. A messenger to carry messages and do odd jobs is essential. To the headquarters come all requisitions, requests, inquiries, etc., and from here emanate all orders, information, etc. Here the chiefs of divisions report, and from this office the entire work is managed and supervised. In order to more clearly indicate the detailed work of the headquarters, the following routine is given:

By 8 a. m. the officer in charge is at his desk; he has heard the report of the clerk, and read over the reports and records of the previous day; the chief of guards now reports, receives his instructions, and departs. Next the inspectors

report. The officer in charge discusses with each in turn, in the presence of the other inspectors, the work in his territory, and after having heard them all, assigns each inspector his territory, and outlines his work for the day. The amount of territory and the nature of the work of the inspectors varies with the period of the epidemic and the situation from day to day. In the first days of the work, when the inspectors are going over new ground, taking the names, etc., of the occupants of each house and vaccinating as they go, their territory will be smaller than later on when vaccination is completed, and the inspection is merely for the purpose of discovering any new case of smallpox that may have developed.

So as to the location of the territory; after the city had been thoroughly inspected a few times it will be found that the infected areas are defined, and they will require constant supervision, while other portions of the city are clean, and will only require an occasional inspection. After the inspectors have received their instructions and depart for their respective territories, the disinfecting division reports through its chief. The work of this division for the previous day is reviewed and new work outlined. The chief disinfecter takes a list of the infected houses that have been reported since the previous day, gets his instructions, and departs. By this time it is 9 o'clock a. m., and telephonic reports from the smallpox hospital and suspect camp have been received. These reports should be in some such form as the following:

“SMALLPOX HOSPITAL, ———, 1899.

“Patients remaining at previous report. ———; patients received since previous report, ———; patients discharged since previous report, ———; patients died since previous report, ———; patients remaining at 9 a. m. to-day. Total, ———; will probably discharge to-day recovered, ———.”

These reports are recorded in a book kept for that purpose.

The officer in charge usually has a short conversation over the telephone with the physician in charge of the smallpox hospital, and also with the one who is in charge of the suspects; he receives their requisitions for subsistence and other supplies, and has them recorded by the clerk. These requisitions are now sent to the grocer and others, with orders to deliver them at the hospital or camp as may be needed.

The officer in charge now has time to see the numerous people who are waiting to confer with him on various subjects. After having disposed of his callers, he goes out to inspect the work of the various divisions and arrange many matters that require his personal attention.

In the meantime at headquarters reports from the inspectors and others are beginning to come in, and are recorded by the clerk in a book kept for that purpose. This record is a sort of journal, and would read somewhat as follows:

“March 9, 1898, 9.20 a. m.: New case at 597 North avenue; name, John Smith, colored; age, 29; first day of eruption; has wife and 6 children in same house. Reported by Jones, inspector. (Note.—Sent ambulance for patient and wagon for suspects at 9.30.)

“10.15: Chief inspector says the 2 barrels of sulphur ordered yesterday have not arrived. Wishes to know what to do.

“10.45: Brown, inspector, reports suspicious case at 42 Lake street, colored child; name, Watkins. (Note by officer in charge.) Referred case to Dr. Williams, who reports child has only a cold.”

Between 5 and 6 o'clock the officer in charge is in his office again; the inspectors begin to arrive and make written and verbal reports of the work of the day. The names and addresses of persons who have refused to be vaccinated are recorded and a copy forwarded to the mayor and other officer for prosecution. The situation is discussed and summed up, showing what progress is being made in suppressing the disease, and work for the morrow is forecast. About this time

the representatives of the newspapers will come in for information, and it is recommended that it be given them freely. Local authorities, fearing to injure the commercial interests of their community, frequently adopt the shortsighted policy of concealing the facts. This does the community far more harm than if the truth were told. When the number of cases, and the location of each is published daily, the public at large is kept fully informed of the true conditions, but where there is concealment it is at once said that the conditions are so bad that the authorities dare not let it be known. The number of cases is greatly exaggerated by rumor, and they multiply as the distance from the cases increases. It has been known that 3 cases, all quarantined in hospital, have been reported as 30 cases and numerous deaths at a distance 20 miles away. It is therefore recommended that the facts be frankly given to the newspapers each day. By 6 or 7 o'clock in the evening the work of the day at headquarters is practically over. Some one should, however, be kept on duty during the night, as frequently new cases are discovered after nightfall, and should have immediate attention.

INSPECTORS AND VACCINATORS.

It is usual to combine the duties of inspector with those of the vaccinator. Inspectors and vaccinators should be physicians, or at least advanced medical students. The reason for this lies in the fact that no one without some medical education is capable of deciding if a given individual has or has not a disease. Not only this, but also because vaccination is a surgical operation, minor, it is true, but nevertheless one that should be performed with all aseptic precautions, a fact that is too often overlooked.

It is frequently asked how many inspectors should be allowed for a given territory. This is a question that can not be answered categorically, as so much depends upon the individual, the amount of work that he does, and the conditions that confront him. It is a good plan to secure the option of as many desirable men as possible, and then put on as many as experience shows to be needed. In making the first few inspections, when it is desirable to cover a large territory in a short time, it is well to put on a large number of inspectors and then gradually reduce the number, weeding out the least desirable. In this way you will soon have a picked corps of inspectors, trained to their work, and who can be trusted.

In organizing this division, the inspectors should be called together, and the situation discussed, and a general policy and method of work outlined. Written general instructions should be given each inspector, and he should be furnished with a certificate, signed by the officer in charge and the proper local authorities, stating that the said inspector had been appointed "inspector and vaccinator," and that he is empowered to execute the sanitary laws and ordinances. The inspectors should now be made thoroughly familiar with all the symptoms of smallpox, and the diseases from which it should be differentiated.

It is well to read to them from some modern standard text-book all that is written on the said diseases. It is well, also, to furnish them with an abstract of the principal diagnostic points of smallpox, especially in its earlier stages. The "Précis on the diagnosis and prevention of smallpox," issued by the United States Marine-Hospital Service, gives all this information in a convenient form. Copies of this précis can be obtained free, on application to the Surgeon-General United States Marine-Hospital Service, at Washington, D. C. It is well to show your inspectors several cases of smallpox in different stages of the disease. It should be unnecessary to add that your inspectors should be immune to smallpox, either by having had the disease or by thorough vaccination. After being sure that your inspectors are capable of recognizing smallpox when they see it, you should teach them how to vaccinate.

Use nothing but glycerinized lymph. This can be obtained almost anywhere.

A successful vaccination is one that shows first a vesicle, and then a pustule, with an umbilication, and has an inflammatory zone extending for an inch or more around its base. The scab usually falls in about twenty-one days.

As a rule a vaccine vesicle requires no treatment. A clean, soft linen bandage may be put over it to protect it from the rubbing of the clothes. Ointments, lotions, etc., are, as a rule, harmful. Avoid the use of shields, especially those made of felt, such as are usually sold by druggists. The wire shield is much less objectionable. A ribbon, with the word "vaccinated" printed on it, and worn around the outside of the coat sleeve, is sometimes of use in protecting against the assaults of one's friends.

What class of cases should be exempt from compulsory vaccination? The writer is of the opinion, personally, that only two classes should be exempt—those who are dead and those who have had smallpox. There may be individual cases where the physician may consider it inadvisable to vaccinate at the time, but unless the physician has some very definite reason against it, he should vaccinate. A good rule is, "When in doubt, vaccinate."

The question of the value of a good scar in protecting the individual against smallpox is often met with. One is frequently confronted with the question, "Is it necessary for me to be vaccinated? I was vaccinated a certain time ago and have a good scar." In reply to such an inquiry, it should be advised that the individual be vaccinated, because if he is immune the vaccination will not take, and if it does take, it shows that he was not protected. No one can say how long the immunity of even a perfect vaccination will last in a given individual; the time varies very largely in different people: some who have been well vaccinated in childhood will never take, no matter how often they are vaccinated; others will take almost every time they are vaccinated. Therefore, to be on the safe side, advise the vaccination of every person who has not had smallpox.

Whenever there is a difference of opinion between a vaccinator and a person to be vaccinated, as to the propriety of his being vaccinated, the matter should be referred to the officer in charge or to the board of health.

Having instructed your inspectors on the above points, each should be supplied with a book, ruled for the following information:

Number, name, color, sex, age, address, date when first seen, date of vaccination or revaccination, successful or not, and remarks.

The inspector now goes to the first house in his district and inquires who lives there, the number of persons occupying the house, their names, and other information according to the ruled columns of his book, noting the same in their proper places. He should now carefully inspect each person living in the house, satisfying himself that each one is perfectly well, and if not, then the nature of the trouble. If, as frequently happens, any one is absent, he should make careful inquiry as to his whereabouts, and the hours when he is to be found at home, and then see that individual as soon as possible. Every person absent under these circumstances should be "suspicious" until found and noted.

The vaccinator should now proceed to vaccinate all persons in the house, with the exceptions noted above, recording the fact in his book. By the end of his second inspection of a district, the inspector should have the name and address of every person living in his territory, and should have personally inspected all of them, with but few exceptions, and those being persons who are away from home, at work, etc., and these should be inspected without delay, going to their places of business if necessary.

He should see every person in his territory at least once in every three days in order to be sure that no new cases of smallpox develop without being discovered. Each inspector should be accompanied, if possible, by a policeman in uniform.

A policeman is of great assistance to an inspector, especially in certain districts

of the city where nothing but a policeman commands respect. He can also keep watch on the outside of the house while the inspector is on the inside, to see that no one escapes from the house, and thus avoids inspection. In the event that a case of smallpox is found in a house, the policeman stands guard to prevent the escape of exposed persons until they can be removed to the suspect camp. The policeman is also of use in protecting the inspector from violence, which is too often offered him. Upon the discovery of an actual or suspicious case of smallpox, the inspector, leaving the policeman on guard, goes to the nearest telephone and informs headquarters of his find, giving name, age, color, and house address of the patient. The responsibility of the inspector and policeman do not end until the case and suspects have been safely delivered to the hospital or suspect camp.

At the end of each day the inspector should report at headquarters and write out a report, giving the number of houses visited, number of persons inspected and vaccinated, and such other information as may be necessary. He should also make a verbal report to the officer in charge as to the general conditions in his territory. The thoroughness with which the inspectors do their work will have much to do with the prompt suppression of the disease. The inspectors are the eyes of the officer in charge.

GUARDS.

Guards are needed for the smallpox hospital, suspect camp, and for cases quarantined at their homes. Their number and hours of duty must be determined by the circumstances in each case. In general, it may be said that the smallpox hospital and suspect camp should be thoroughly guarded, day and night, and the tour of duty of each guard should be from eight to twelve hours during the twenty-four. There should be a chief and an assistant chief of guards, who divide the duty of the twenty-four hours between them, one of them always being on duty. The guards should be inspected at frequent and irregular intervals to see that they are properly performing their duty. Any guard found asleep on post or disobeying orders, or otherwise neglecting his duty, should be promptly disciplined. The chief of police is frequently utilized as chief of guards, and the arrangement is usually satisfactory.

SMALLPOX HOSPITAL.

It will not be practicable here to enter into all the details of the equipment and management of a smallpox hospital, but the essentials will be given. The number of cases, the local conditions, and other circumstances will modify the details for each community.

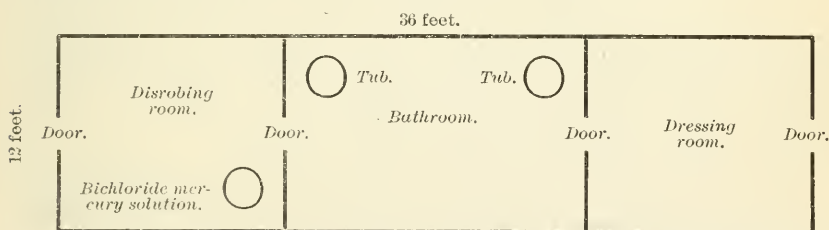
Primarily, the hospital must be under the management of a physician, who should be quarantined with the patients, if possible, and should hold no direct communication with the outside world. If this is not practicable and the physician has to live on the outside of the hospital, he should exercise the greatest care that he does not convey the infection from the patients. Elsewhere are given the precautions that should be observed in order to prevent carrying the infection. As stated before, the number of cases and other circumstances modify the details, but the following are essentials:

A building or buildings capable of holding all the patients that are liable to be sent to it should be secured. The location of the hospital is important. It should be somewhat remote from other buildings, but close enough to the city to be easy of access for the transportation of patients, supplies, etc. A distance of 100 yards from other buildings or the roadway is sufficient. There must be at least 2 wards—1 for men and 1 for women. In the South, where race feeling is strong, it will be well to have 2 hospitals—1 for white and 1 for colored patients—duplicates of each other. If most convenient, tents can be used. The hospital need not be an

elaborate affair—a single story building, with a ridge roof about 20 feet wide, and of sufficient length to give all the room needed, with a transverse partition dividing it into 2 wards. The material can be rough pine lumber, 1 inch thick, and the building roofed with tarred paper: this is all that is usually needed. In colder climates in winter it may be necessary to cover the outside with paper, and possibly to sheathe with rough boards, to make it warm enough. The wards can be heated when necessary by stoves and lighted as is most convenient. Electricity is preferable, but hanging kerosene lamps are generally used. A kitchen and dining room should be built in the same way. A bountiful supply of water must be furnished. If practicable, city water should be piped to the hospital; but if this is not possible, then there should be a good spring or well near at hand and within the inclosure. The hospital should be located on a hill, with many shade trees and as much grass as possible.

A barbed-wire fence, closely strung, should surround the hospital at a distance of 200 feet at the nearest point. There should be but one entrance to this inclosure, and that should be provided with a gate, and carefully guarded. Near the gate, and inside the inclosure, should be a small building for the use of the guard in stormy weather, and it should have a room in which the physician can change his clothing, etc. This building should contain a telephone, connected with the general telephone system of the city.

If the physician is quarantined with the patients, he should live in a tent, or a small rough house, built for that purpose. Not far from the gate, and on the opposite side from the guard's house, and nearer the hospital, say 100 feet from the hospital, should be a bath house, consisting of at least three rooms. The following diagram gives a very simple but effective arrangement:



This bath house is intended for the disinfection of patients prior to being discharged from the hospital. The details of this disinfection will be given later in their appropriate place.

Latrines, or earth closets of sufficient size, should be built at a convenient distance from each ward and the excreta carefully covered with dry earth and unslacked lime. The wards should be furnished with cots without mattresses. It is not necessary to supply bed clothing, as when a patient is brought to the hospital his bed clothing should be brought with him. As this clothing has frequently to be burned, anyway, after the case is well, it saves expense to have the patient use it in the hospital. This plan also obviates the possibility of any complaint as to the quality. A blanket or two spread on the cot makes a more desirable bed than a mattress and is more easily disinfected. A few chairs, several wooden settees or benches, and a few wooden tables constitute the ward furniture.

Dark-colored roller window shades should be put at the windows, and a large-faced nonstriking clock will add much to the comfort of the patients.

Adequate arrangements for personal ablutions should be made. A tin basin, a towel or so, and a piece of good soap for each patient, to be used only by that patient, is a satisfactory arrangement.

The kitchen must be completely equipped with cooking stove, utensils, etc., and in summer a large refrigerator and a bountiful supply of ice must be supplied.

A portion of the kitchen building should be partitioned off for a subsistence storeroom and another room for other supplies.

The hospital force should not consist of less than the following, and this number should be increased as the necessity arises: One physician in charge, 2 nurses, one for each ward, 1 cook, 1 assistant cook, 1 or 2 dining-room waiters and helpers, 1 general utility man.

All of these should be smallpox immunes from having had the disease, if possible; otherwise they should be thoroughly vaccinated. It is frequently possible to secure good helpers from among the recovered patients.

The physician should always keep on hand a small supply of drugs, liquors, etc.

The telephone in the guard's house should be the means of communication with the outside world. Supplies should be inquired for at 9 a. m. daily at headquarters. When the supplies arrive they should be deposited at the gate by the driver and left. The guard now takes them and deposits them at a designated spot within the inclosure, from whence they are taken to the hospital by the utility man, the guard having retired to the gate. A small shed to cover the supplies will be of use in protecting them from the sun and rain. A megaphone or tin horn will be of service in calling the utility man. The guard must under no circumstances approach the hospital nearer than 100 feet. No person except the patients, physicians, and guards must be allowed to enter the inclosure, and no person or articles be allowed to leave it until after a thorough disinfection by one of the methods given later.

The hospital should be supplied with a vehicle that can be used as an ambulance to transport patients to the hospital. The ambulance should be driven by an immune, and he should change his clothing before leaving the hospital.

No patient should be discharged from the hospital until all scaling of the skin has ceased, and the skin is perfectly smooth. For several days before discharge it is well to require the patient to take a bath, once or twice daily, and to rub the skin thoroughly with vaseline or some similar substance.

Red spots, where pustules have been, will frequently persist for a long time, but these do not convey infection if the skin is perfectly smooth.

When a patient is ready for discharge, he should go into the disrobing room of the bath house, remove all the clothing that he has worn in the hospital, and drop them into a tub containing a solution of bichloride of mercury, 1-1000. He then passes into the bathroom and thoroughly washes himself with soap and water, especial care being taken to see that the hair is thoroughly cleaned. He now takes a thorough bath in a 1-1000 solution of bichloride of mercury, and, having dried himself, passes into the dressing room. Here he finds sterile clothing that has previously been disinfected. He dresses himself and proceeds to the guard's house, where he receives his certificate of discharge from the physician, and departs without having reentered the hospital or having come in contact with any infected person. This certificate should give the name, age, color, sex, and address of the patient, date of discharge, and should state that his (or her) clothing has been thoroughly disinfected, and he (or she) is free from infection or the danger of conveying the same.

In the event that a patient has but one suit of clothes, it is not necessary to supply him with a new suit, as his old clothing can usually be disinfected as follows:

On the day previous to his discharge, supply the patient with a suit of overalls, if a man, or a gown, if a woman, and require him to go some distance from the hospital, and with soap and water thoroughly wash his clothing, underclothing, etc. His shoes, hat, etc., should be dipped in a solution of bichloride of mercury, 1-1000. After thoroughly washing all his clothing, each piece should be dipped in the solution of bichloride of mercury and hung in the sun to dry. On the morrow, when these clothes are dry, the guard takes them and puts them in the dressing

room of the bath house, where they are ready for the patient after he takes his bath and is ready to be discharged.

Letters and other articles that would be injured by being wetted, may be disinfected by sulphur, burned in a closed place, in the proportion of 5 pounds to each 1,000 cubic feet of air space, and left therein for twenty-four hours; or, what is more convenient, place them in a close box, sprinkle them with formalin solution, and let them remain for six hours.

If the physician can not be quarantined at the hospital with the patients, then he must exercise the greatest care that he does not convey the infection, and, what is almost as important, does not seem to convey it. When visiting the hospital he must always be careful to change his clothing before entering, and again as soon as he comes out. In other words, he must never enter the hospital with the same clothing that he wears when he mingles with the public. When he goes to the hospital he should put on a suit of overalls, and when he comes out of the hospital he should make the circuit of the bath house in the same manner that a patient does when he is discharged.

Doubtless many other details will suggest themselves to the physician when he gets his hospital established, but enough has been said to enable him to make a successful beginning. Do not call the smallpox hospital a "pesthouse." Many patients are willing to go to the "smallpox hospital" who would object most violently to going to the pesthouse.

SUSPECTS AND SUSPECT CAMPS OR HOUSES.

By a suspect we mean a person who has been exposed to infection, and is liable to develop the disease.

Among the most prolific sources of the spread of smallpox are the persons who, having been in contact with the disease, scatter to their homes and there develop the disease, thus establishing new foci of infection. In order that this source of danger may be eliminated it is necessary that all persons who have been exposed to infection shall be disinfected, vaccinated, and isolated for a period covering the incubation of the disease. This is best done in a suspect camp or detention house.

When a case of smallpox is discovered care should be taken not to announce the fact until provisions have been made to prevent the escape of persons who have been exposed to the infection. As a rule (and this is especially true of negroes) as soon as it is known that a case of smallpox exists in a house there is a stampede of the inmates, and if they are not prevented they will scatter all over the city, and it will be impossible to find them.

As soon as possible after notification of the existence of a case of smallpox at a given place, headquarters orders the suspect wagon to the house, and all suspects are removed to the suspect camp. They are accompanied by the policeman (who was left there on guard by the inspector), for the purpose of preventing the escape of any of them on the way. The house should be locked and sealed as soon as the case of smallpox and the suspects are removed. A placard with "SMALLPOX" in large letters printed on it, and bearing a notice signed by the board of health or the officer in charge, warning all persons under the penalty of the law from entering or disturbing said house until the card is removed by the proper authorities, should be placed on the house. The card should be removed by the disinfecting division only after the house has been disinfected and is thoroughly safe.

The suspect camp or house is built very much like the smallpox hospital, and it is managed in much the same manner. It is called a camp because most frequently tents have been used to contain the suspects, rather than a house, but the one is as good for the purpose as the other. As all the persons under detention are supposed to be well, they do not require the attention that is needed by the

smallpox patients. If buildings are used they should be of the same kind and number as noted for the smallpox patients, and equipped and run in the same manner.

The suspect camp should be in charge of a physician, but it is not necessary that he be quarantined with the suspects. The suspect house or camp is usually located near the smallpox hospital for economy and ease of administration. It should be also surrounded by a wire fence, and one set of outside guards can guard both the camp and the hospital.

When suspects are brought to the camp they are sent through the bath house, and, on emerging therefrom, the men are given overalls and slippers, and the women gowns and slippers, to wear until their own clothes can be disinfected and returned to them. In cold weather it may be necessary to supply each suspect with a blanket, in addition to the above. After the suspects have been disinfected they should be vaccinated, and then detained for fourteen full days. The clothing of each suspect should be tied into a loose bundle, and tagged with the name of the owner. It should now be disinfected by one of the methods given. As a rule, disinfection by sulphur or formaldehyde will be the most convenient. The suspects should be disinfected and given sterile clothing before being allowed to go into the house or camp. Each suspect should be detained fourteen full days from the date of disinfection, not counting the day of admission or the day of discharge. This plan is safe, and safety is our aim.

A record should be kept, giving the name, age, color, sex, date of admission, and date of discharge of each suspect, with his address and other information of note. No suspect should be discharged under fourteen full days after disinfection, and if in the course of his detention a case of smallpox breaks out in the suspect camp, all suspects who have come in contact with it or who have been liable to infection should be at once disinfected again and detained for fourteen days from the date of the last disinfection, and the quarters carefully disinfected. Be careful not to discharge a suspect under the fourteen full days. It has been known that suspects who were discharged after twelve days' detention have developed smallpox on the fourteenth day; that suspects discharged on the morning of the fourteenth day have had the initial chill of smallpox on the same afternoon. It has also happened that suspects who were detained fourteen full days, but whose clothing had not been disinfected, developed smallpox a few days after their discharge, showing that they were infected by the clothing of themselves or some other suspect. Therefore, disinfect the person and the clothing, vaccinate all suspects, and detain them in quarantine for the full fourteen days, not counting the day of admission or discharge, thus making sixteen days' detention.

Suspects should be inspected at least once daily, and better twice daily. At a certain hour require all suspects to form in line in front of their quarters. The physician should go slowly down the line and carefully inspect each one. If anyone does not seem to be perfectly healthy, take that case aside for a more extended examination.

Should one of the suspects develop any symptoms of smallpox, he should be at once isolated and kept apart from the rest of the suspects until the nature of his trouble develops. For this purpose it is well to have a tent or small house within the inclosure where such cases can be isolated. It is well also to provide a place where suspects suffering from noncontagious diseases can be treated, for you may have cases of ordinary sickness develop among them, and in fact you are very liable to have such cases.

Before a suspect is discharged he must make the circuit of the bath house, and go through the same form of disinfection as to person and clothing as a patient in the smallpox hospital. He should also be given a certificate of discharge similar in form to the certificates given patients discharged from the smallpox

hospital. The suspect camp should have a wagon, with a driver in charge, always at the camp for the purpose of bringing in the suspects, and their bedding, clothing, etc.

DISINFECTING.

This is one of the most important of the divisions, and its work must be thoroughly done if a recurrence of the disease is to be avoided. This division should be in charge of a competent, level-headed man, preferably a physician, who will give the most careful attention to the details.

The duties of this division are to thoroughly disinfect all infected houses, articles, etc. The various methods of disinfecting will be given hereafter, and it depends on which method is used as to the appliances necessary. Disregarding for the moment the more expensive method of disinfecting by formaldehyde, we will consider what is needed for disinfection by sulphur and bichloride of mercury, the methods usually most available. Whatever means are used, it will be necessary to have one or more large farm wagons, each drawn by 2 mules, for the purpose of transporting the outfit from house to house.

For disinfection by sulphur we need 6 or 8 large iron pots, each capable of holding about 15 gallons; an equal number of wooden washtubs; several barrels of roll sulphur; a 5-gallon oil can filled with alcohol; about 20 pounds of raw cotton for stuffing cracks; a pot of paste, with a large brush; several old case knives; and a number of old newspapers. The paste and papers are used to close openings, such as the fireplace, which can not be closed by stuffing with cotton. The knives are for pushing the cotton into the cracks. It is necessary that the cracks should be well closed. Proceed with the disinfection as described under that head.

For disinfecting with bichloride of mercury we will need several empty oil or whisky barrels, a good-sized force pump, and some 300 feet of rubber hose in 50-foot lengths [see that the hose fits the pump, otherwise it will be useless]; about 50 pounds of bichloride of mercury, and several agate-ware measures for making up the solution. In disinfecting with the bichloride solution, the disinfectors should wear rubber boots and coats, old broad-brimmed hats, and it is well to protect the eyes by glasses from the flying spray. The method of disinfecting is given under its appropriate heading.

The following are the methods of disinfecting:

Disinfection of articles.—(a) Mattresses, pillows, quilts, and other articles that can not be readily disinfected, should be burned.

(b) All articles that will stand boiling should be boiled for at least one hour. A handful of washing soda should be put in the water in which the clothes are boiled. After boiling, the clothes should be rinsed in clean water and dried in the sun.

(c) Articles that can not be boiled should be dipped in a solution of bichloride of mercury (1-1000), and dried in the sun.

(d) The furniture should be thoroughly washed down with the bichloride solution.

Disinfection of the house.—If a hut or shanty and of small value, it should be burned; otherwise it should be disinfected by one of the following methods:

If the house is close and will retain the gas, it can be disinfected by either formaldehyde or sulphur dioxide. If it is too open to admit of disinfection by this means, it must be washed down with a solution of bichloride of mercury (1-1000).

(a) *Disinfection by formaldehyde.*—All openings, and especially those around windows and doors and the fireplace, should be closed by stuffing with cotton or some similar material, or by pasting paper over the cracks. The formaldehyde is usually introduced through the keyhole of the door in amount equal to 4 per cent of the volume of the air in the room, and the room left closed for not less than six

hours. As formaldehyde requires the use of a generator, it will probably be more convenient generally to use sulphur.

(b) *Disinfection by sulphur*.—Close house as above, with the exception of one door for each room to be disinfected, and in each put a tub of water; in each tub put an iron pot capable of containing double the amount of sulphur required. Put in each pot sulphur enough to give 5 pounds for each 1,000 cubic feet of air space. Pour on a small amount of alcohol; see that the sulphur is thoroughly ignited, then leave the room; close the door and stop all the cracks. Leave the room closed for twenty-four hours.

(c) *Disinfection by bichloride of mercury solution*.—If the house is too open to admit of disinfection by the above-mentioned gases, it must be thoroughly washed down with a solution of bichloride of mercury (1-1000). Every portion of the room should be thoroughly wetted with the solution, and the room should not be occupied for twenty-four hours. The doors and windows should be kept open to facilitate drying.

SMALLPOX IN COUNTRY DISTRICTS.

While the foregoing remarks have been made with especial reference to smallpox in cities and towns, they are equally applicable to country districts. Because the territory is extended, and the population scattered, is no reason why any of the precautions should be relaxed; on the contrary they should be increased. It is so much easier for smallpox, especially the mild type of the present epidemic, to escape notice in the country districts, than in a town.

If an eruptive disease appears in a country district, it is the duty of the authorities to learn the nature of that disease, and if it seems contagious, it should be isolated. If a doubt exists, an expert should be called to settle the diagnosis. All cases of so-called "chickenpox," "Cuban itch," "elephant itch," "nigger itch," and the like, should be at once isolated; in nine out of ten cases these prove to be smallpox.

Another point that is sadly neglected in country districts is vaccination. This is partially due to apathy on the part of the authorities, and partially to the prejudice that exists among the people against vaccination. This prejudice is the result of ignorance of the true facts, and to the alarming rumors in circulation as to the results following vaccination. Rumors of arms, legs, or life lost as the result of vaccination have, as a rule, no foundation in fact.

It is true that within the past year or so, with the use of the "dry point" for vaccination, there have been a number of badly inflamed arms, that have persisted for some time, but this has been due to impure virus, or to some extraneous cause. With the use of glycerinized lymph no such trouble occurs. From the reports of a good many thousand vaccinations with the glycerinized lymph, there have been only a few extremely inflamed arms, and it is by no means certain that these were due to the vaccine virus.

If these facts are explained to the people by some one in whom they have confidence, much of the opposition to vaccination will disappear.

Without thorough vaccination it is almost impossible to suppress smallpox; therefore the authorities in country districts are urged to give this their earliest attention.

If vigorous measures are taken to isolate the first cases of smallpox and all exposed persons, and all infected houses and articles are promptly and carefully disinfected and vaccination is thorough, the suppression of the disease is an easy task.

IN CONCLUSION.

It is advised that whatever measures are adopted they should be made thorough.

Measures, good or bad, half done are worse than useless, as they give a fancied security.

Smallpox can not be suppressed without the expenditure of money.
 The more promptly you act the less it will cost.
 When in doubt, act on the safe side.
 Finally, the following motto is offered for your banner in smallpox work:
 "Isolate, vaccinate, disinfect." Vaccinate with glycerinized lymph.

REPORTS FROM THE NATIONAL QUARANTINE STATIONS.

Following are the reports from the medical officers in command of the thirteen domestic quarantine stations owned and operated by the Marine-Hospital Service, showing the sanitary operations at the stations and giving detailed accounts of the repairs and improvements to the buildings, piers, and vessels.

There were in addition quarantine inspection stations conducted during the year by medical officers at Alexandria, Va.; Washington, Newbern, and Beaufort, N. C.; Pascagoula, Miss.; Eureka, Cal., and Grays Harbor, Wash.

REEDY ISLAND QUARANTINE; POST-OFFICE ADDRESS, VIA PORT PENN., DEL.

[Report of the medical officer in command, P. A. Surg. R. M. WOODWARD. Assumed command under official orders of January 27, 1897.]

REPORTS OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

REEDY ISLAND QUARANTINE, VIA PORT PENN., DEL., *June 30, 1899.*

SIR: I have the honor to report the following sanitary transactions at this station for the fiscal year ended June 30, 1899:

Number of vessels inspected	1,008
Number of vessels disinfected	6
Number of steerage passengers inspected	9,028

Respectfully, yours,

R. M. WOODWARD,
Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REEDY ISLAND QUARANTINE, VIA PORT PENN., DEL., *June 30, 1899.*

SIR: In accordance with paragraph 644, Regulations Marine-Hospital Service, I have the honor to append hereto a detailed statement of the repairs and improvements which have been made at this station during the fiscal year ended June 30, 1899.

Fifty-nine unserviceable piles beneath the pier and island gangway have been replaced, together with certain braces and sheathing. A new row of fender piles has been driven the entire length of the east front of the disinfecting pier, and the pier extended on this side 3 feet. The disinfecting room on the pier has been divided into an "infected" and a "disinfected" room, and both rooms floored and wainscoted to the square. Bathrooms, with two shower baths and a bath tub, have been erected, containing a pressure tank, two "gegenstroms," and an accessory hot-water heater. A complete formaldehyd and ammonia apparatus has

been installed in connection with the steam chambers, two portable autoclaves being also provided. A vacuum pump has been replaced by a steam ejector which creates a perfect vacuum in less than two minutes. Iron plates have been placed in the floor in front of the sulphur furnace to avoid danger from fire. The large tank in the north end of the pier building has been cut in two and the lower half raised on a trestle to provide pressure for the baths. A railing has been erected on the porch of the attendants' building similar to that on the other buildings. All of the buildings on the station, including the pier building, have been painted with three coats of white lead and oil. A tower and tank, with pump house, have been built over the artesian well, it being the intention to provide a hot-air engine, thus securing water pressure for domestic purposes and for fire. The attendants have built a small pier on the Port Penn side of the island and have laid numerous board walks, in addition to many minor repairs and improvements. The steamer *Pasteur* has been overhauled and a ventilator placed in the fore-castle. The appropriation is now available, and work will soon begin upon repairs to the levee and building quarters for crews while undergoing disinfection.

Respectfully yours,

R. M. WOODWARD,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

DELAWARE BREAKWATER QUARANTINE; POST-OFFICE ADDRESS VIA LEWES, DEL.

[Report of the medical officer in command, P. A. Surg. G. B. YOUNG. Assumed command under official orders of November 27, 1897.]

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

DELAWARE BREAKWATER QUARANTINE STATION, VIA LEWES, DEL.,

September 8, 1899.

SIR: I have the honor to transmit herewith the following summary of the transactions of this station during the fiscal year ended June 30, 1899:

Number of vessels boarded during the year	254
Number of vessels from infected ports	52
Number of vessels detained in quarantine	5
Number detained on account of smallpox	3
Number detained on account of yellow fever	2
Number of persons landed and detained	260

Respectfully, yours,

G. B. YOUNG,

Passed Assistant Surgeon, M. H. S., in Command.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

DELAWARE BREAKWATER QUARANTINE STATION, VIA LEWES, DEL.,

August 29, 1899.

SIR: In compliance with paragraph 644, Regulations of 1897, I have the honor to submit the following report of the repairs and alterations made at this station during the fiscal year ending June 30, 1899:

In many cases material on hand or derived from a variety of sources was used, the labor being in whole or in part that of the attendants, and it is consequently impossible to give the exact cost of the work. I have therefore summarized the

cost of such improvements as best I could, and have lumped together the work on the Marine-Hospital Service and quarantine service accounts.

Executive and quarters building.—Window screens have been fitted to all the basement windows and the panels of the storeroom doors replaced by wire nettings, thus providing for free ventilation.

A new set of tubes has been provided for the Horton boiler of steam-heating plant: cost, \$196.

The walls and ceilings of all the rooms have been painted two coats, the wood-work revarnished, and the radiators rebronzed; cost, \$300.

The portion of the reservation containing the executive building and stable has been inclosed in a barbed-wire fence some 1,100 feet in length. The timber for posts was collected from the beach, the wire purchased.

An area about 150 feet by 200, immediately in front of the executive building has been enclosed with a post and chain fence, a portion sodded, and the rest covered with earth and manure and sowed with grass seed. A number of flower beds have been planted and are doing well. Water has been piped from the tanks at the engine house to the above area, and two hydrants put in to supply the sprinkling needed. The pipe was obtained from an abandoned line belonging to the United States Engineers. The posts from wreckage, for other material and expenses about \$250 was expended.

The old boathouse which served as a stable has been shingled, the carriage room and stalls ceiled and oil finished, neat closets for harness, etc., put in, a feed room constructed with bins, etc., windows and doors put in, and a hydrant and watering arrangements provided. The total cost in labor and material was about \$230.

A new set of double, and one of single harness have been purchased: cost, \$108.

New Dayton wagon, \$140; repairs to old wagon, \$25; team, including freight, \$325; lap-ropes, \$26.

Hospital building.—A new roof has been put on the main building. The entire building, inside and out has been painted two coats. All shutters, doors, fastenings, plaster, etc. repaired. Changes have been made in the upper story so as to provide a good linen room. Each attendant has been provided with a neat locker, with drawers, shelves, hooks, etc., for the stowage of the clothing which formerly hung on nails in odd corners. Bedside stands and rugs have also been provided for the attendants' quarters, also window shades and lamps. The cost of most of this is included in a contract price as given below in connection with other items.

An excellent bathroom, with porcelain lavatories, a closet and tub has been provided for the attendants, who formerly performed their ablutions at the kitchen sink; cost, \$125.

The end of the porch at the steward's quarters has been inclosed, ceiled, and oil finished, and a very neat bathroom put in, filling a long-felt want; cost for construction included in contract: cost for fixtures, \$125.

The 8-foot fence closely surrounding the hospital has been moved so as to inclose a considerably larger area, and at the same time leave the hospital entirely outside of the quarantine inclosure, and the portion of the fence toward the executive building, and fronting the sea, has been cut down to the height of an ordinary picket fence, and whitewashed, two coats; producing a very great improvement in the appearance of the place.

A new coal bin has been constructed by the attendants; cost of material, \$75.

A new room intended to provide accommodations for the nurse has been built at a cost of \$150.

Suspect hospital.—An addition has been made to this building, containing bathroom, lavatory and water-closet; cost, \$500.

Barracks.—The old tar-paper roofs have been removed from the barracks and kitchen, and shingle roofs put on; the buildings have been guttered and provided with down spouts; the sand drifts have been removed from about the buildings;

the defective weatherboarding removed; the old pine posts and rotting sills under all the buildings removed and replaced with heavy oak posts and much heavier sills than those formerly used. The platforms in front of the barracks and kitchen have been rebuilt in a very substantial manner and painted. The buildings have all been painted; all locks, windows, doors, etc., repaired. An addition has been erected to the boiler house and the electric-light engine and boiler set up and put in perfect order, doubling our steaming capacity and affording an insurance against break downs. A large size Rider pump has been put in and the small Knowles pump moved to the new engine house. A tank holding 10,000 gallons has been erected on a frame at sufficient height to give pressure service over all buildings. The various items enumerated in connection with the hospital and barracks for which the detailed price has not been given cost in the aggregate \$7,295.

A change has been made in the end building of the east barracks, giving a good paint room, with shelving, etc., and a large carpenter shop, ceiled inside and provided with a complete outfit of new tools. The labor was furnished by the attendants; material and outfit cost about \$300.

The section of east barracks nearest the engine room has been converted into a general storeroom and the miscellaneous property formerly scattered over the reservation collected and put in order, a partition dividing the section from the rest of the barracks. A room has been cut off from the end of the L at the barracks kitchen and a general storeroom for barracks bedding and clothing constructed. The four small rooms at kitchen end of barracks have been furnished, provided with stationary basins and running water and separated by partitions from the rest of the barracks. Most of the labor was performed by the attendants. About \$100 was spent for material, etc.

The sink to the barracks kitchen which formerly discharged upon the ground, has been connected with the sewer by means of iron sewer pipe; cost, \$25. Changes have been made in the end of the west barracks by means of which eight good single rooms have been provided for officers of vessels and cabin passengers under detention. The rooms are plainly but sufficiently furnished, have stationary basins and running water in each room, with a bathroom and water-closet on each floor. In connection with this 400 feet of iron sewer have been laid. A sitting room has also been arranged, though rather a rough one. Cost of work and furnishing, about \$700.

Urinal.—A neat house has been built in rear of male barracks and a good iron-trough urinal put in and connected with the sewer, superseding the rotten old zinc trough hitherto in use; cost, \$75.50.

Laundry.—The old laundry has been ceiled and painted and a good steam laundry put in; cost, \$1,300.

Lumber.—The sum of \$650 has been expended for lumber used in a multitude of repairs and alterations, etc.

Fire protection.—A system of fire hydrants, with hose, etc., has been put in, there being seven stations for 2-inch hose, and four for 1½, and some fire extinguishers have been provided; cost, \$500.

Lighting.—Fourteen lamp-posts, with large Dietz lamps, have been put up; cost, \$50.

Cistern.—A brick cistern holding 16,000 gallons has been put in and connected with all the barracks' down spouts and with the pumps and pressure tanks; cost, \$1,000. The camp has been provided with a new outfit of tentage; cost, \$314.40.

Lavatory.—A lavatory building has been erected for the male barracks, with stationary iron wash basins, a urinal and 15 closets, arranged in groups of 3, and constructed to flush thoroughly by an automatic mechanism. The building is very satisfactory in every way. With the sewer extension necessary the cost was \$1,200.

Piping.—The entire water piping system has been reconstructed. A 3-inch main run to barracks, the old faucets along walls removed, and in place 3 drinking hydrants provided, the old elevated steam pipe to artesian well taken down, covered, boxed, and buried; water pipes from tanks insulated and boxed; all the miscellaneous piping about engine room, tanks, well, laundry, and bath house taken up and relaid in such a manner as to bring all controlling valves to one place at the engine house, so as to enable us to use the artesian driven well and rain water and the two sets of tanks independently of each other, interchangeably, or as supplements to each other. Labor mostly done by attendants. Cost of material, about \$200.

Disinfecting machinery.—The steam chamber has been provided with a formalin attachment and a vacuum jet. Cost of apparatus and alterations, \$228.92. A new grate has been put in the boiler and a new set of tubes; cost, \$256.63. A new gasket has been put in the doors of steam chamber; cost, \$24.60.

Pier and boats.—A new landing pier has been built and a house for small boat; cost, \$100. A new whaleboat and a whitehall boat have been built for station, \$305. An arrangement for hoisting out the launch and housing her has been built on the iron pier; cost, \$305.

All of which is respectfully submitted.

Respectfully, yours,

G. B. YOUNG,

Passed Assistant Surgeon, M. H. S., in Command.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

CAPE CHARLES QUARANTINE; POST-OFFICE ADDRESS, FORT MONROE, VA.

[Boarding and disinfection ship *Jamestown*, Hampton Roads; hospitals and detention barracks, Fishermans Island, off Cape Charles, Virginia.]

Report of the medical officer in command, P. A. Surg. W. J. PETTUS. (Assumed command under official orders of November 16, 1895.)

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

CAPE CHARLES QUARANTINE, *July 20, 1899.*

SIR: I have the honor to submit the following report of transactions at this station during the fiscal year ended June 30, 1899:

Vessels inspected and passed with pratique.....	350
Vessels disinfected	17
Vessels refused pratique without disinfection, afterwards leaving for Northern ports.....	15
Total	382

Steamer Dagmar.—Repairs to water tanks, ash pans, replacing old piping with new, \$266.80. Minor repairs to engine crossheads and repairing pump, \$6.42. New cooking range, \$27.85. Hauling out vessels on ship railway, scraping and painting bottom, repairs to water-closets and sea cocks and steam whistle in September and June, \$265.95. New furnace doors and frames and repairs to plumbing, calking and repairing deck, \$355.08. Repairs to piping, \$63.87. Repairs to woodwork on deck, new bed springs and mattresses, \$58.75.

Steamer Koch.—Repairs to sulphur pipe, air pump, fresh-water tank, and connections, \$105.23. Taking out old sulphur furnace, putting in new one, rebuilding deck house, putting supporting stanchion in engine room, \$1,243.95. Hauling out, scraping, and painting bottom, general repairs to engines, pumps, and connection, \$229.18.

Fishermans Island.—One new 10-foot range with fittings, \$356.81. Building new tank tower, removing old tank from wharf and mounting it on new tower,

\$475. Repairs to wharf and gangway, replacing old piles with new ones, \$2,394.56; also bulkhead to protect disinfecting house from wash of the sea.

Jamestown.—Dry-docking ship, recoppering along water line, recalking and patching copper where worn off, new piping for collecting fresh water from roof, \$1,231.07.

Naphtha launch.—Only some minor repairs were made to the naphtha launch.

ADDITIONS, ALTERATIONS, AND REPAIRS NECESSARY DURING 1900.

Steamer Dagmar.—General repairs to woodwork should be done; cost, about \$300. New awnings and skylight covers are needed; cost, \$72. Steamer should be hauled out and bottom scraped and painted; cost, \$140. The condition of the hull on the inside seems bad from corrosion by rust, so a careful examination should be made by the local inspector of hulls to determine just how much her seaworthiness is impaired. All the sea cocks should be replaced by new ones when the vessel goes on the railway again. Repairs to rigging will be necessary. A new water tank for the boiler should be put in to replace the one removed last year, which was destroyed by rust. Both masts are rotten.

Steamer Koch.—New canvas covers for the upper decks are needed, as the old ones are rotten and leak. Lower deck needs recalking, with repairs where necessary; cost, \$175. The wearing strips on guard rails are badly worn and should be renewed; cost, \$20.

The vessel should be hauled out, scraped, and painted, and a leak which has started by the rudder stopped; cost, \$150. The worn-out gratings in the stern should be removed and a sulphur bin put there. There is no place for keeping sulphur except in barrels on deck. The roof over the engine room has sunk, needing a stout iron stanchion in the engine room to support it. The heat from the sulphur furnace has charred the deck house above it, causing considerable danger of fire. Would recommend that the furnaces be covered with magnesia, just as the conducting pipes are.

Ship Jamestown.—A steam windlass should be placed in the bow for hoisting anchors; cost, \$1,500. Two new derricks are needed to replace the old ones, which are unsafe and rotten; cost, \$50. A new bit on main deck should be put in to replace one broken last year while getting up anchors.

Fishermans Island.—The present quarters for the keepers are in a bad condition and should be replaced by new ones; estimated cost, \$2,200. An isolation ward should be built with capacity for eight beds, room for nurse, and closets; cost, \$1,500. The verandas to both barracks are rotten and in an unsafe condition; new ones would cost \$1,000.

W. J. PETTUS, Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

CAPE FEAR QUARANTINE STATION; POST-OFFICE ADDRESS, SOUTH-PORT, N. C.

[Report of the medical officer in command, P. A. Surg. B. W. BROWN. Assumed command under official orders of August 2, 1898.]

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1898.

CAPE FEAR QUARANTINE STATION,
Southport, N. C., July 17, 1899.

SIR: In accordance with paragraph 644, Regulations Marine-Hospital Service, I have the honor to transmit herewith a report of the repairs and improvements which have been made at this station during the fiscal year ending June 30, 1899.

During the year 90 ships arrived at this station; 73 of these were inspected and passed, 2 spoken and passed, 10 disinfected, and 5 held for observation.

Barracks for the attendants have been completed and are now occupied. Two cisterns, of 1,000 gallons capacity each, and a derrick have been erected, and a hoisting engine installed. This work was done on authority of the sundry civil appropriation bill, approved July 1, 1898, appropriating \$3,300 for construction of men's quarters, cisterns, and derrick at this station. There was not enough money appropriated to have the building painted, but with the paint on hand two coats were applied to the men's quarters and one coat to the hospital, water-closet, and railings around the gangway. A house has been erected over the hoisting engine to protect it from the weather, and this house and the derrick have been painted. The boats, including the launch, have been overhauled and painted. The north-east dolphin, which was carried away by the ice during the cold spell of last February, has been replaced, and sheathing which was torn from quite a number of piles has been patched. A partition separating the disinfecting house into two rooms has been built, thus enabling the officer to effectually guard against the reinfection of the disinfected clothing. The formaldehyde apparatus sent this station has been connected with the disinfecting chamber and works satisfactorily. Shelves have been placed in the storeroom at the station and a bath tub erected in the disinfecting house and connected with one of the cisterns. During the year the office was removed to a more suitable building and a flag pole has been erected on the roof of this house. Shelves have been placed in two of the rooms and the stores have been arranged as far as possible in accordance with the property return.

Respectfully, yours,

B. W. BROWN,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

SAVANNAH QUARANTINE, SAVANNAH, GA.

[Report of the medical officer in charge, A. A. Surg. W. J. LINLEY.]

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING THE MONTHS OF APRIL, MAY, AND JUNE, 1899.

QUARANTINE STATION,

Savannah, Ga., October 6, 1899.

SIR: In compliance with instructions received in Bureau letter dated September 29, 1899, I have the honor to submit the following report of transactions occurring at this station during the fiscal year ended June 30, 1899, and of improvements, additions, and repairs made during the same period. As the Service did not assume charge of the station until April 17, 1899, the report does not cover the entire period in detail, though the summary of the year's work given may prove of interest.

From April 17, 1899, to June 30, 1899, 68 vessels were boarded and inspected. The nationality and class, with the countries from which the vessels cleared, appear in the following tables:

Countries from which vessels cleared.

Cuba	18	Canary Islands	2
England	9	Scotland	1
France	5	Austria	1
Germany	4	Portugal	1
Holland	3	Africa	1
Belgium	3	Uruguay	1
Norway	2	Santo Domingo	1
Spain	2	Bahama Islands	1
Italy	2	United States	9
Brazil	2		

Nationality and class.

	British.	Norwegian.	Swedish.	German.	Dutch.	Belgian.	Italian.	Austrian.	American.	Total.
Steamships.....	7	2			1	2			7	19
Barks.....		21	1	3				1		33
Tugboats.....									4	4
Schooners.....	2								6	8
Barges.....									4	4
Total	9	23	1	3	1	2	7	1	21	68

Of the 68 vessels boarded, 49 were given pratique after inspection, and 19 detained. Fifteen of the latter were from Cuba, 2 from Brazil, 1 from Santo Domingo, and 1 from Uruguay. Included in the 19 vessels detained were 4 American transports, 3 of which, after the discharge of baggage and soldiers at this station, were remanded to Sapelo for disinfection and 1 released without pratique for New York; 6 were vessels which had been disinfected at Cuban ports by officers of the Service and detained here until the expiration of their period of observation. Two American transports from Habana were allowed to take coal and provisions, and discharge mules and horses, while lying in quarantine; the workmen engaged in loading these vessels were detained five days for observation after the disinfection of their effects. One American schooner, disinfected at Santiago, having been over five days from port and no sickness having occurred, was released after inspection.

Though the Service did not assume charge of the station until April 17, P. A. Surgs. J. O. Cobb and A. C. Smith were practically in charge from March 23, the local quarantine officer having received the following instructions:

SAVANNAH, GA., *March 23, 1899.*

SIR: I have requested Dr. Cobb and the officers of the Marine-Hospital Service to inspect and superintend the fumigation of all army transports entering this port, so that you may be able to give your attention to the merchant vessels over which they have no control. This, of course, entitles them to make use of our plant when not necessary for merchant vessels.

Yours, truly,

HERMAN MYERS, *Mayor.*

Between March 23 and April 27, an immense amount of work was rendered necessary at this station by the return of 17,839 American soldiers to the United States through the port of Savannah. Previous to April 1 the soldiers were released on the completion of the disinfection of their baggage and effects; 6,700 passed through in this manner, 5,919 having been treated here, and the remainder at Sapelo. After April 1, 10,766 soldiers, in addition to the above treatment of their baggage, etc., were held five days for observation at the Daufuski detention camp, 373 having been previously treated and detained at Dry Tortugas, were passed directly up to the city on arrival. The transports and crews, after the discharge of the troops and their baggage here, were remanded to Sapelo for disinfection. Full reports, by the officers in charge of the work, have appeared in Sanitary Abstracts of April 21 and 28, May 19, and June 9, 1899.

In accordance with authority obtained in Bureau letter of June 16, 1899, on the 24th of June the quarantine steamer *Thekla* was turned over to Messrs. John Rourke & Son, of Savannah, Ga., for the purpose of having the following repairs made: New tail shaft; new stern bearing; new propeller; new shoe; lining up engine; fitting link of engine; new stuffing-box glands for main valves and cut-off valves of engine; 3 stud bolts—2 on main valve and 1 on circulating-pump head;

new thrust ring for shaft; boring out cylinder true; 1 bull ring and 2 spring rings; new bottom on port water tank, renewing bulwarks, guard rail, and stanchions on port side, and around stern as far as starboard quarter bit; calking main deck; replacing forward deadlights; repairing door casing of cabin; new door for pilot house.

The *Thekla* was badly run down, and could not have been kept in commission without a thorough overhauling. The contract cost of the above repairs was \$1,143.50.

The old 6-inch falls for hoisting ballast were replaced by 4½-inch manila rope falls, at a cost of \$39; the old falls were badly worn, were too large for the blocks, and unsafe. The station was furnished with a Francis-Kinyoun autoclave for use in the disinfection of vessels; cost, \$85. The rubber gaskets to the steam cylinder being worn-out and unserviceable, were replaced by lead gaskets; cost, \$11.13.

Repairs and improvements should begin with the winter season; ballast carts and tubs, the boiler for operating the steam cylinder, etc., are in bad condition, and quarters for attendants, storerooms, isolation building, etc., are greatly needed.

Summary of year's work.

	British.	Norwegian.	Swedish.	German.	Dutch.	Belgian.	Italian.	Portuguese.	Austrian.	Russian.	American.	Total.
Steamships	97	15	-----	3	1	6	-----	-----	8	-----	66	196
Ships	1	5	-----	6	-----	-----	2	-----	-----	-----	1	14
Barks	3	111	11	15	1	-----	42	1	7	2	1	194
Barkentines	3	-----	-----	-----	-----	-----	1	-----	-----	1	1	6
Brigs	-----	-----	-----	-----	-----	-----	1	1	-----	-----	-----	2
Tugboats	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	4	4
Steamers	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	1
Barges	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	4	4
Schooners	9	-----	-----	-----	-----	-----	-----	-----	-----	1	15	23
Yachts	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	2
Total	113	131	11	24	2	6	46	2	15	4	91	445

Total number of vessels boarded during the year, 445; crews, 13,233; passengers (principally soldiers), 19,975.

Vessels detained, 58: Brazil, 18; Cuba, 31; Uruguay, 1; Venezuela, 1; Guiana, 2; Honduras, 1; Barbados, 1; Trinidad, 1; Jamaica, 1; United States, 1.

Ballast discharged, 1,446 tons of sand and 2,328 tons of rock.

Ballast brought by vessels: Water, 143; sand, 79; sand and stone, 52; rubbish, 44; rock, 28; light, 25.

Cargoes: Cement, 17; logwood, 2; phosphates, 4; salt, 11; coal, 1; staves, 1; clothing, 1; fruit, 2; iron pyrites, 8; rosin, 1; iron, 1; mules, 2; hay and grain, 1; soldiers' baggage, 11; china clay, 1.

Respectfully, yours,

WM. J. LINLEY,

Acting Assistant Surgeon, U. S. M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

THE QUARANTINE FUNCTIONS AND THE QUARANTINE STATION OF SAVANNAH, GA., TRANSFERRED TO THE MARINE-HOSPITAL SERVICE.

Overtures having been made by the mayor and the city council of the city of Savannah, Ga., for transferring the quarantine station and the exercise of the quarantine functions for Savannah, Ga., to the Marine-Hospital Service, a formal agreement was drawn up and signed, in accordance with which the city of Savannah has leased to the Treasury Department, for use by the Marine-Hospital Service, its

buildings, disinfecting apparatus, piers, and other appurtenances of the quarantine station at Savannah, in accordance with section 8 of the quarantine act of February 15, 1893, and the Marine-Hospital Service, acting for the Treasury Department, has purchased the boarding vessel necessary for the inspection of incoming vessels, and has retained in service the former quarantine officer, Dr. William J. Linley, and the quarantine employees.

The quarantine was formally turned over to the Marine-Hospital Service on April 18, 1899, Surg. J. H. White receiving the same and assuming charge. Dr. White also acted as appraiser of the value of the property in conjunction with a representative of the city council of the city of Savannah, the Department agreeing to recommend to Congress the purchase of the property at its appraised value at or before the expiration of the lease.

Surgeon White, having effected the business connected with the transfer, and under orders, was relieved by P. A. Surg. A. C. Smith, who was succeeded by Acting Assistant Surgeon Linley, May 2. The following correspondence explains the terms of transfer:

TREASURY DEPARTMENT,
OFFICE OF THE SURGEON-GENERAL, M. H. S.,

Washington, D. C., April, 1899.

SIR: I have the honor to invite your attention to the proposition of the mayor and aldermen of the city of Savannah to transfer their quarantine station to the control of the Marine-Hospital-Service. The acceptance of this proposed transfer will be in line with the policy heretofore adopted and the recommendations to Congress by the Department as to the control of maritime quarantine. In view of the fact that troops are now returning from Cuba through this station at an average rate of nearly a regiment a day, and in order to effectually conserve the public health, it has been necessary to station 4 commissioned officers and 4 acting assistant surgeons at this station in connection with this work, on account of the immense volume of disinfection and inspection to be done. I believe it to be to the best interests of the public health to accept the proposition of the mayor and aldermen for said transfer. The National Government has had employed in this work of inspection and disinfection nearly 100 officers and men, a force so large that it would have been beyond the financial ability of the city of Savannah to undertake this work. It may be seen that at least at this time, national control of this station is an absolute necessity. This station is practically second only to New Orleans in sanitary importance among the quarantine stations of the South, and the value of national control here is very great. It is believed that permanent control can only redound to public benefit, there being a continued possibility of troops returning through this station from West Indian duty.

I would recommend that the tugboat *Theckla* be immediately purchased and paid for from the epidemic fund, and that a recommendation be made to Congress for an appropriation to cover the cost of the station and the necessary improvements to the equipment thereof.

Respectfully, yours,

WALTER WYAM,
Surgeon-General M. H. S.

The SECRETARY OF THE TREASURY.

TREASURY DEPARTMENT, *Washington, April 15, 1899.*

DEAR SIR: I am in receipt, by reference, of your letter of April 8, 1899, addressed to the Surgeon-General of the Marine-Hospital Service, relating to the transfer of the quarantine station of the city of Savannah to the control of the National

Government, as represented by the Marine-Hospital Service, and forwarding an agreement promulgated by the committee of the city council of Savannah, which I quote as follows:

"(a) Proposal of Committee of City Council, Savannah.

"The committee appointed under a resolution of council at its meeting of April 5, 1890, will recommend to council an agreement to turn over to the United States Government Savannah's quarantine station, under a lease or contract for two years, with the following stipulations:

"(1) At the end of this term, should the city elect to continue the Government's control permanently, then the Government will take the city's holdings at quarantine, exclusive of the tug, at a valuation of \$20,000, and will pay for the tug now \$5,000. Should these valuations not be satisfactory to the Government, they shall now be fixed by arbitration.

"(2) The Government will continue the employment of all employees now connected with the station and tug, unless there be objection to their efficiency or competency.

"(3) Should the Government's control be discontinued at the end of the term, then the improvements put in by the Government will be taken by the city at a valuation to be agreed on, or, in the absence of an agreement, to be determined by arbitration.

"(4) The Government, in the event of an acceptance of this proposition, will, for the purpose of more expeditious and thorough service, increase and improve the wharf discharging and disinfecting facilities of the station.

"I hereby attest that the foregoing is a true copy of a report prepared and adopted by a special committee of the city council of Savannah.

"WM. P. BAILEY, Clerk of Council."

In view of the reply which is to follow, and in accordance, as I am informed, with the wishes of yourself and the committee of the council, it is understood that the following additional paragraph (5) is added to the proposal of the committee, namely:

"(5) In case the Government elects to discontinue at any time the control of the station, then in that event all improvements made by the Government shall be appraised at their intrinsic value to the city."

In reply to the foregoing proposal I have to state that under the provisions of section 8 of an act approved February 15, 1893, authorizing the acceptance by the Secretary of the use of buildings and disinfecting apparatus at a State quarantine station, and also under the provisions of the act of Congress approved July 1, 1898, "making appropriations for sundry civil expenses of the Government for the year ending June 30, 1899," including "preventions for epidemics," this Department agrees to the terms mentioned in the proposition of the city council in so far as it may be done without Congressional action, but will recommend the latter, and therefore makes this formal rejoinder to the proposition.

"(b) Terms of acceptance by Treasury Department.

"The Treasury Department agrees to lease the buildings, appliances, etc., of the Savannah quarantine at a nominal sum, as provided in the proposition of the city council, to purchase the tug now at a cost of \$5,000, and to fix by arbitration the valuation of the property at the quarantine, as provided in paragraph 1 of the city's council proposition.

"The Department also agrees to maintain quarantine, continuing the employees, as provided for in paragraph 2 of the city council's proposition.

"The Department will recommend to Congress the legislation necessary to carry out the remaining provisions of paragraphs 1, 3, and 4, the tenure of site at the

expiration of the lease, continuing under authority of the War Department for quarantine purposes.

"The Department also agrees to paragraph 5, the addendum to the proposition of the city council, and will recommend to Congress, in the event of this paragraph becoming operative, the legislation necessary to carry out the intent thereof."

It is believed that the foregoing agreements will be of mutual advantage to the city and to the Department, and I would suggest that, in closing the same, the proposition of the city council marked (a) and the terms of acceptance marked (b) should be considered as forming one document, to be certified to by the proper authorities of Savannah and of this Department.

In accordance with these suggestions, I transmit this letter in duplicate, both copies bearing the signature of my acceptance, and after the formal acceptance by the proper authorities of the city of Savannah has been affixed to this letter and to the duplicate I have to request that one copy be retained by yourself and the other transmitted to the Department.

Respectfully yours,

O. L. SPAULDING, *Acting Secretary.*

Accepted:

O. L. SPAULDING, *Acting Secretary.*

HERMAN MYERS, *Mayor,*
Savannah, Ga.

Accepted on the part of the city of Savannah, subject to the conditions of necessary Congressional legislation, as per accompanying report, this 18th day of April, 1899.

THE MAYOR AND ALDERMEN OF THE CITY OF SAVANNAH,
By HERMAN MYERS, *Mayor.*

Attest:

WM. P. BAILEY, *Clerk of Council.* [SEAL.]

SAVANNAH, GA., April 18, 1899.

I hereby certify that the accompanying is a true and correct copy of the report of a special committee appointed under resolution of council adopted April 5, 1899, which was presented and adopted at a called meeting of council held April 17, 1899, his honor the mayor being authorized to enter into an agreement or contract with the Secretary of the Treasury in accordance with the provisions of the report.

Witness my official signature and the seal of the city of Savannah the year and day above mentioned.

WM. P. BAILEY,
Clerk of Council, City of Savannah, Ga.

SAVANNAH, GA., April 17, 1899.

To the Mayor and Aldermen of the City of Savannah:

Your committee, appointed under a resolution of council at its meeting of the 5th instant, with reference to the transfer of the quarantine station of the city of Savannah to the National Government, beg leave to recommend the making of an agreement whereby for a nominal rent the quarantine station will be turned over to the United States Government under a lease or contract for two years, containing the following stipulations:

1. The United States Government will now take and pay for the city's tug used at quarantine the sum of \$5,000. At the end of the term of two years, should the city of Savannah elect to continue the Government's control permanently,

then the Government will take the holdings of the city at quarantine, exclusive of the tug, at a valuation to be now fixed by arbitration.

2. The Government will continue the employment of all employees now connected with the station and the tug, unless there be objection to their efficiency or competency.

3. Should the Government's control be discontinued at the end of the term, then the improvements put in by the Government will be taken by the city at a valuation to be agreed on, or, in the absence of an agreement, to be determined by arbitration.

4. The Government, in the event of an acceptance of this proposition, will, for the purpose of more expeditious and thorough service, increase and improve the wharf discharging and disinfecting facilities of the station.

5. The Treasury Department will, at as early a date as may be practicable, secure whatever Congressional legislation may be necessary to carry out this agreement in its spirit and purpose, and should such legislation not be had this agreement will terminate and the city will have the right to retake possession of the quarantine at once.

HERMAN MYERS,
Mayor.

DAVID WELLS,
ST. J. B. GRAHAM,
JOSEPH G. JARRELL,
GEORGE W. TIEDEMAN,
Aldermen.

LETTER FROM THE MAYOR OF SAVANNAH FORWARDING SIGNED AGREEMENT.

SAVANNAH, GA., *April 18, 1899.*

DEAR SIR: By request of Dr. J. H. White, of the Marine-Hospital Service, I beg to inclose herewith the agreement, which has been prepared in duplicate, entered into between the city of Savannah and the United States Government, properly executed and with the necessary certificate as to the authority of the mayor to sign the same in behalf of the municipal government.

I desire to express my hearty appreciation of the promptness with which you have acted in this matter and the evidences afforded of a determination on the part of the Government to meet the city in a spirit of unbounded fairness and with an eye to its welfare, as well as to the promotion of the health interests of the country at large. In wishing you and the Marine-Hospital Service every success in its work at Savannah and elsewhere, I take the opportunity to assure you that I have not the slightest doubt but that the change just made will inure to the benefit of the city of Savannah, and that it will prove satisfactory in the end to every one of its citizens.

We stand ready, at all times, to cooperate with you in every way in the maintenance of health. Whoever may be in charge at the quarantine station will find the city authorities willing to render every assistance in their power.

Very respectfully,

HERMAN MYERS, *Mayor.*

Surgeon-General WYMAN,
Marine-Hospital Service, Washington, D. C.

ORIGINAL COST OF SAVANNAH QUARANTINE.

Memorandum of improvements at Savannah quarantine station.

Original cost of station, including dwelling for quarantine officer and wharves.....	\$30,797.47
Fumigating plant	12,975.00
Tug	9,500.00
Other improvements, estimated.....	3,000.00
Total.....	56,272.47
Correct:	

HERMAN MYERS, *Mayor*.

APPRAISEMENT OF SAVANNAH QUARANTINE.

SAVANNAH, GA., *April 18, 1899.*

We, the undersigned commissioners, appointed to represent respectively the honorable Secretary of the Treasury and the honorable mayor of Savannah, Ga., in estimating the value of the quarantine property at Savannah, Ga., have the honor to report the following values as having been found by us, to wit:

Tug <i>Theckla</i>	\$5,000
Wharf, hoisting machinery, and tramway	10,000
House.....	5,000
Barracks.....	1,000
Attendant's barracks	250
Attendant's kitchen	50
Disinfecting plant and contents, steam chamber, sulphur furnace, engine, boiler, and pump	3,700
	25,000

J. H. WHITE,

Surgeon, M. H. S., Representing Secretary of Treasury.

St. J. B. GRAHAM, M. D.,

Representing Mayor of Savannah, Ga.

LEASE OF SAVANNAH QUARANTINE.

SAVANNAH, GA., *April 20, 1899.*

DEAR SIR: The city of Savannah offers to lease to the United States Government, through your department, all the improvements, of whatever nature, at the quarantine station at the mouth of the Savannah harbor, for a term of two years, at the rate of \$300 a year.

Your acceptance below of this proposition will be all that is necessary to bind the city of Savannah to the same.

By THE MAYOR AND ALDERMEN
OF THE CITY OF SAVANNAH,
HERMAN MYERS, *Mayor*.

Hon. LYMAN J. GAGE,

Secretary of Treasury, Washington, D. C.

Accepted:

L. J. GAGE, *Secretary*.

SOUTH ATLANTIC QUARANTINE; POST-OFFICE ADDRESS, INVERNESS,
GA.; TELEGRAPHIC ADDRESS, VIA DARIEN, GA.

Report of the medical officer in command, P. A. Surg. H. S. CUMMING. (Assumed command
under official orders of May 15, 1899.)

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

SOUTH ATLANTIC QUARANTINE STATION,

July 25, 1899.

SIR: I have the honor to submit herewith the following report of the transactions of the Service at this station during the fiscal year ending June 30, 1899, in accordance with paragraph 644, Revised Regulations, Marine-Hospital Service:

Sanitary.—During the year 82 sailing vessels were inspected and passed and 5 disinfected.

Steam vessels, 11 were inspected and passed and 11 were disinfected.

Total tonnage of sailing vessels passed	73, 049. 84
Total tonnage of sailing vessels disinfected	2, 209
Total tonnage of steam vessels passed	23, 197. 03
Total tonnage of steam vessels disinfected	26, 566. 82

Of these disinfected, 2 were from Rio, 2 from Santiago de Cuba, 4 from Habana, 2 from Cienfuegos, and 1 from each of the following ports: Casilda, Key West, Matanzas, Daiquiri, Paramaribo, and Bahia.

Of the steam vessels disinfected 9 were transports, with troops returning from Cuba, and the baggage and personal effects of all on board were disinfected.

A large proportion of vessels disinfected here are remanded from other stations.

The hostilities and consequent interference with commerce during the year was probably the cause of the decrease in number of vessels from infected ports.

Improvements.—A new disinfecting outfit has been installed upon the new western wharf, consisting of a 12-horsepower hoisting engine for discharging ballast at the new spur, sulphur furnace, engine blower, delivery pipe (galvanized iron), bichloride pump, tank, etc.; cost, \$1,900. As I write, there are two vessels lying at the wharves, which shows the usefulness of a double system.

Boathouse for the new pier has been completed; cost, \$1,000.

Quarters for crew on the end of the new pier, bath house connected with disinfecting wharf, and shed for machinery described above have been built; cost, \$1,000.

Two tanks for bichloride solution	\$108. 72
One bichloride pump	90. 98
One mooring buoy installed	265. 00
Five plain dolphins driven	600. 00
Four plain dolphins in front of the old ballast wharf	480. 00
Extending old ballast spur	100. 00

A formaldehyde apparatus for the steam chamber and an autoclave have been furnished, at a cost of \$270.

A hospital has been completed on the shore opposite the pier. It has a ward 24 by 28 inches and 4 rooms for the use of attendants and physicians.

About 50 feet to the east of the hospital, running out into the sound 300 feet and in a line with the old ballast spur, a new landing gangway has been built.

In addition thereto the contractor drove 90 feet additional piling and capped them. These piles could not be driven in the ballast crib as there was no room. Cost, with 1 creasoted dolphin and piles to gangway, \$1,425.

A telephone line has been built from the "south end" to the pier, thence to

Cedar Point on the mainland, and arrangements made whereby messages are transferred over other private lines to Darien and the railroad station, Crescent. It is hard to conceive how the station could be run without it even in its present condition. Cost, \$2,500.

The deepening of Elliott's cut, begun in May, 1898, was continued in a desultory, spasmodic way by hand for months, and has done little good.

It is impossible to dig a narrow 8-foot ditch in mud and sand and have permanent results. Cost, \$500.

Repairs.—October 2 a hurricane and tidal wave visited the island and inflicted much damage.

At the north end the house on the east end of the iron pier occupied by attendants was destroyed, the wharf wrenched, and ballast spur denuded of caps and rails.

The contractor who was repairing the crib, etc., lost his machinery and much delay ensued.

At the south end the whole island was inundated, the Lazaretto and its contents destroyed, and an inlet about half a mile wide (and constantly increasing) cut through from the ocean to the old inlet, about 1,000 feet south of the commanding officer's quarters. The water in the latter was 12 or 15 inches deep and damaged paint and furniture.

The launches were both lifted bodily over onto Sapelo Island and were safe and uninjured when found. All stock was swept away, but afterwards all save one bull and one cow were recovered. Fences were destroyed and small buildings swept from their foundations. Many repairs were consequently necessary. Following are the repairs:

18 copper-covered piles to iron wharf	\$1,728.00
Sheet piling, decking, etc., to old ballast crib.....	3,887.00
Repairing old ballast spur	247.00
Sundry repairs to the old hoisting engine, sulphur furnace, and other machinery (other than launch engines)	268.85
Sundry fittings for launches	26.65
Returning them to the water	28.85
For paints, oils, etc.	306.98

With the latter the station force has painted the whole interior of the cottage and roofs of the cottage, bath house, coal house, etc., two rooms and the hall in the commanding officer's quarters, with its exterior, and two in the executive building, occupied by the assistant surgeon.

At the north end the buildings on the new wharf and part of the hospital were repainted, and both launches repainted.

The attendants' quarters have just been given a coat inside and two on the porch.

New underpinning was placed under the executive building during the early spring and the ground floor is now being floored and prepared as a storeroom and shop by the station force at odd times.

The engine of the *Mercury* is now at the builders', and authority has been given to get fittings for the *Delta*, which launch was injured by fire in the early spring.

Sundry repairs are constantly being made by the station force with material found on the beach, but little can be done during the active season save in an intermittent, spasmodic way.

Improvements needed during the coming year.—House about 25 by 30 feet to replace the one washed away from the iron pier, east of the disinfecting house. It is urgently needed for crews of vessels undergoing disinfection. Cost about \$750.

Shower baths in the bathrooms.

Negotiations are under way concerning the repair of the disinfecting chamber,

repair of its boiler and of the old sulphur-fan elbow pipe and connecting of the formaldehyde apparatus.

The old hoisting-engine boiler is weak about one hand-hole and needs repairing as reported.

A towboat is urgently needed at this station, one which could if necessary go to Savannah for supplies. She should have accommodations for a medical officer during the active season and be capable of handling vessels at the pier.

The work at this station is very large and growing; several times during the past few weeks a delay of a day or two has been caused by two vessels being at the pier, one or both having been disinfected and a third waiting for suitable tide and wind to enable the one to haul out, the other in.

Material to be used by the station force in ceiling the crew house on the new extension and the old attendants' quarters on the ballast crib is asked for elsewhere.

At the hospital, connection with the water supply, 1,300 feet distant, at a cost for material of \$275, work to be done by station force, should be at once commenced.

In the hospital no provision has been made for heating at all; three chimneys should be built; also one for its kitchen and one for the crew quarters on the new wharf.

Requisition for hospital furniture has been forwarded.

There is no place to use as a bath and toilet room for the ward; one can be built on the west porch by station force, and the window cut into a door.

Direct telephonic communication with the telegraph office is needed instead of the present three transfers with their frequent mistakes. Negotiation is under way to accomplish this with little or no expense to the Service.

Owing to the large number of vessels with sand ballast now being disinfected here the sand is being swept to the front of the pier and is filling in there.

The present old ballast spur and new landing gangway should therefore be connected, a distance of about 1,200 feet. Estimated cost about \$3,000. This would connect the pier with the hospital and shore and the sand could be dumped there.

Material for ceiling the crews' quarters, the old house on the ballast crib, and for redecking the gangway from crib to the disinfecting pier and the eastern part of the iron pier will cost about \$400.

The work can be done during the winter by the station force.

A new horse, harness, and Dayton, or similar light vehicle, is needed. Cost about \$275.

A gate on the gangway will be built to prevent unauthorized communication between vessels undergoing disinfection.

The buildings on the old piers are to be painted.

The exteriors of the cottage and the commanding officer's quarters need painting badly, the latter having been unfortunately painted just before the hurricane, which denuded its east, north, and south sides. Paint, etc., for this work, the executive building, porches, and offices, boats, and launches, rest of buildings on the pier will cost about \$300 for material.

Gutters are needed on the cottage. Estimated cost \$20.

The superintendent of construction has forwarded plans and estimates for raising the commanding officer's residence upon concrete pillars, and while this is being done cisterns could be built at small cost, as pure drinking water is needed.

In this connection your attention is respectfully invited to the necessity of immediate action to prevent further encroachment by the inlet and river upon the south end.

The topographical changes during the past year and even during my few weeks' stay have been decided. A lifelong observation of the vagaries of the ocean convinces me that my observation has been for too short a period to enable me to

advise action, and the wisdom of sending an inspector who has been familiar with the island for an extended period is urged.

Respectfully yours,

HUGH S. CUMMING,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF P. A. SURG. J. A. NYDEGGER ON THE EFFECTS OF THE STORM AT SOUTH ATLANTIC QUARANTINE, OCTOBER 2, 1898.

[Omitted from Annual Report for 1898.]

SOUTH ATLANTIC QUARANTINE STATION, *October 3, 1898.*

SIR: I have the honor to confirm telegraphic report of the severe storm that visited this station yesterday. Much damage was done at the north end: Flooring on a portion of iron wharf was torn up. Quarters for crew located on same wharf were demolished and thrust into end of disinfecting shed. Old ballast wharf and machinery located on it suffered. Old ballast gangway carried away completely. Boat landing, almost completed, was swept away, leaving only the piles standing. New hospital had foundation badly washed, and is, I think, out of plumb; windows and shutters broken. All bridges are gone.

The lazaretto at south end, containing hospital furniture, tents, etc., was swept out to sea. Officers' quarters and all buildings suffered and some are off of foundations. Surgeons' quarters, being low and facing the ocean, were flooded by the sea, and much damage done within and out and can not be occupied until renovated and repaired. Fences and much loose property were carried away. Telephone line is gone. The naphtha launches dragged anchors and are high and dry on Sapelo Island. The large one is far inland and will require much labor to get it off and back to station. The station force, with four men employed temporarily at \$3 per day, will possibly get small launch afloat to-night. These men will be retained a few days to assist in replacing floating bridge and getting large launch off.

Nine cows are missing, but it is hoped some of them will be found later on the adjacent island.

The south end of the island was completely submerged and cut in two by the sea a short distance below the quarters.

An experienced steward would be of much assistance in getting the property together and accounting for that which is lost.

Respectfully, yours,

JAMES A. NYDEGGER,

Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

BRUNSWICK QUARANTINE, BRUNSWICK, GA.

[Report of the medical officer in charge. Sanitary inspector, R. E. L. BURFORD.]

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

BRUNSWICK QUARANTINE, *October 9, 1899.*

SIR: I have the honor to report the transactions of the Service at this station during the fiscal year ending June 30, 1899, and to report the improvements, repairs, and additions made to this station during the same period.

One hundred and eighty-five vessels were inspected and passed and 46 vessels disinfected.

One vessel from Bahia, with sand ballast, and having a history of 1 case of yellow fever and 1 death on passage, was remanded to South Atlantic Station for disinfection.

Those disinfected here were from the following ports: Rio de Janeiro, 10; Habana, 5; Ponce, P. R., 4; Santos, 3; San Juan, P. R., 3; Bahia, 2; Santiago de Cuba, 2; Matanzas, 2; Daiquiri, 2; Sagua la Grande, 2, and 1 each from Guanatanamo, Gibara, Caibarien, Nuevitas, Cienfuegos, Cardenas, Para, Pernambuco, Tampico, St. Thomas, and Key West.

Improvements.—Quarters for attendants, a 3-room house with piazza and porch, was built at a cost of \$498. The former quarters occupied by attendants was destroyed by storm of October 2, 1898.

Two new wharves were built, one in front of disinfecting shed and one on site of ballast plant. The disinfecting wharf is 30 feet in width and 72 feet in length. The ballast wharf is 20 feet in width and 30 feet in length, and supplemented by dolphins to make secure berth for vessels. Mooring dolphins were supplied for both wharves. Total cost, \$520. The wharves which formerly occupied these sites were destroyed by storm of October 2, 1898. The present wharves are built on foundation pilings of green pitch pine 15 inches in diameter, driven to a depth of 15 feet and 10 feet from centers, capped with timbers 12 inches square, bolted to pilings and cross capped by timbers 3 by 9 inches, notched and bolted to caps, and the whole covered by 2-inch flooring spiked to joists.

New furniture was purchased at a cost of \$115 to replace like articles lost by storm. A new stove and cooking utensils were purchased at a cost of \$45. Those formerly in use were destroyed by storm.

A new autoclave was added to the disinfecting plant.

The hospital building was repaired at a cost of \$63.95. It was carried from its foundation by storm of October 2, 1898, and had doors and windows damaged. It was replaced on foundation, braced, and other damage repaired.

Eight dollars was expended for wheelbarrows and shovels to aid in the handling of ballast from vessels.

An appropriation of \$4,500 has been secured for further improvements to the station.

Respectfully, yours.

R. E. L. BURFORD,
Sanitary Inspector, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF SANITARY INSPECTOR R. E. L. BURFORD ON DESTRUCTION OF BRUNSWICK, GA., QUARANTINE BY STORM AND TIDAL WAVE OCTOBER 2, 1898.

[Omitted from Annual Report for 1898.]

BRUNSWICK QUARANTINE, *October 4, 1898.*

SIR: I have to report the total destruction of all wharves and buildings of this station with the exception of disinfecting shed and hospital building, partly wrecked, by storm and tidal wave on Sunday, October 2 instant.

The wind was blowing a gale from the northeast as early as 3 o'clock a. m. Sunday. It increased in intensity during the forenoon, the velocity of the wind being greatest between 12 and 1 o'clock. By 10 o'clock a. m. the sea had flooded the buildings of the station, so that all persons were obliged to leave them and seek refuge on higher ground. Near the western end of the station there is a high ridge of earth formed by the dumping of ballast along the line of an elevated railway, the highest point being about ten feet above the mean level of the station and about eight feet higher than the wharves and floors of the buildings of the station. In less than an hour's time after seeking refuge here the water had risen until all of this ridge was covered except a small knoll 30 feet in its greatest diameter; and it was there that all sought refuge, lying flat on the ground

to avoid being blown into the sea. We kept this position until 4.30 p. m., at which time the water had fallen, so that with difficulty we were able to get to the small hospital building used as surgeons' quarters, and there pass the night. A steamer came to our relief the next morning and took us to Brunswick.

The attendants' quarters were totally destroyed; the wharves, ballast run, cars, ballast tubs, and one hoisting engine carried away. All of the furniture except that in small hospital building was destroyed. The storeroom and all provisions except canned goods lost. The disinfecting shed badly damaged, but disinfecting machinery unhurt except smokestack and the 8-inch galvanized-iron pipe to sulphur furnace, which were carried away.

Respectfully, yours,

R. E. L. BURFORD,
Sanitary Inspector, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

TORTUGAS QUARANTINE STATION; POST-OFFICE ADDRESS, KEY
WEST, FLA.

Report of the medical officer in command, Asst. Surg. TALIAFERRO CLARK. (Assumed command under official orders of May 15, 1899.)

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

TORTUGAS QUARANTINE, VIA KEY WEST, FLA.,

July 1, 1899.

SIR: I beg to submit the annual report of the operation of this station for the fiscal year ending June 30, 1899, as follows:

The total number of vessels of all classes disinfected at this station during the past year was 86, as follows:

American	64
Norwegian	8
British	7
Spanish	6
German	1
Total	86

Of this number there were 16 steamships and 1 tugboat, divided as follows:

American	5
Norwegian	5
Spanish	4
British	2
German	1
Total	17

The net tonnage for the season just ended was 45,434 tons, distributed as follows:

American	23,107
British	9,001
Spanish	8,757
Norwegian	4,479
German	1,090
Total	46,434

The effects of 2,807 persons, including crew of vessels and passengers, and soldiers returning from Cuba, were disinfected, using steam and formaldehyde gas.

Of the 86 vessels disinfected during the fiscal year, 12 were in ballast other than

water. In addition, 3 vessels were inspected and passed, and 8 others left without treatment.

In connection with the disinfection of baggage and effects of soldiers returning from Cuba, I beg to incorporate the most excellent report of Asst. Surg. W. R. duRand, in temporary charge:

DETENTION OF TROOPS AT TORTUGAS QUARANTINE STATION.

TORTUGAS QUARANTINE, FLA., May 22, 1899.

SIR: In compliance with Bureau letter (P. M. C.) of May 12, 1899, directing a report of operations, under orders received in connection with troops returning from Cuba, I have the honor to make the following report:

Acting under telegraphic orders to proceed to Tortugas and report to Assistant Surgeon Anderson, I arrived at this station on March 23. On the morning of March 26 the transports *Florida* and *Kilpatrick*, having on board the First Regiment of Texas Volunteer Infantry, arrived. The *Florida*, carrying the baggage, equipment, and 4 companies of the regiment, was brought to the wharf, while the *Kilpatrick*, too large to enter either channel, anchored in the outer harbor.

The troops on the *Florida* were at once disembarked, and as each company landed its blanket rolls and the contents of knapsacks were inspected. All fabrics were tied up in the blankets, the bundles marked by stencil, and placed in the steam chamber. The ponchos were placed in piles by companies, and dipped in a solution of bichloride of mercury 1-1,000 by quarantine employees. The companies were marched into the fort and quartered in the casemates.

The heavy baggage was hoisted onto the dock and there opened by details from the companies. The clothing and fabrics were made into bundles under the careful supervision of a medical officer, marked, and, after steaming, repacked.

The tents, cots, etc., remaining in the hold were arranged to permit of penetration, the baggage replaced, and all subjected to fumigation by sulphur dioxide.

The uniforms of the officers were placed in staterooms and disinfected by formaldehyde gas. Three days were required to complete work on the *Florida*.

The majority of the troops were on board the *Kilpatrick*, but as they had no baggage with them on the boat, except their blanket rolls and knapsacks, their disinfection was easily accomplished. With the energetic aid of Acting Assistant Surgeon McConnell, the fabrics contained in the blanket rolls and knapsacks were made into bundles, marked, and sent to the disinfecting wharf by the tugboat *Powhatan*. An immediate inspection of the vessel was made, and it was found that a number of articles, such as towels, underclothes, etc., had been left out of the knapsacks, so these were collected and placed in a solution of bichloride. The ponchos were dipped in bichloride solution on board. The uniforms of the officers were treated as on the *Florida*.

Several trunks were found in the rooms of the officers, and these were treated by unpacking, sprinkling formalin between the successive layers of clothes as they were replaced, and closing the lids tightly.

Both vessels were discharged on March 30. During the last three days of this work Assistant Surgeon Anderson was physically unfit for duty, but, in spite of illness, carried on the work with unflagging energy, and maintained a strict personal supervision over every detail.

On March 31 the transport *Vigilancia* arrived, with 4 companies of the Ninth Illinois Volunteer Infantry on board. The vessel had left Habana without a bill of health. As this transport was also too large to be brought to the dock, it was necessary for the medical officer to remain on board, while Senior Hospital Steward Kolb conducted the steam disinfection at the wharf.

The blanket rolls, knapsacks, ponchos, and the uniforms of the officers were treated as outlined for the transport *Kilpatrick*.

The heavy baggage was opened in the hold by the troops, under careful observation, and the clothing made into bundles and sent to shore. Particular attention was paid to the hospital equipment used in Cuba, as a number of dirty mattresses and some soiled linen had been packed away. After the baggage had been unpacked, the hold containing the boxes was fumigated with sulphur dioxide.

On April 2 the disinfected clothing was returned to the ship, and after an inspection of the troops the vessel was discharged.

Some inconvenience was experienced in treating these vessels, as the supply of formalin shipped to this station had been delayed en route, and there was none on hand for use in the autoclaves. The generation of the gas from methyl alcohol proved unsatisfactory, as the lamps were about worn-out and unreliable. Fortunately, Acting Assistant Surgeon McConnell had a sufficient supply on hand for the disinfection of the trunks on board his vessel.

The transport *Logan*, bringing the Third Nebraska Volunteer Infantry to this place for disinfection and detention, arrived on the morning of April 8. She was too large to reach the wharf, so was anchored in the outer harbor. A heavy norther was blowing and the sea was so rough that neither troops nor baggage could be landed. After waiting two days for the weather to moderate the vessel left for Savannah without unloading.

I wish to acknowledge the hearty cooperation and valuable suggestions given by Assistant Surgeon Lumsden in arranging plans for handling these troops.

Respectfully, yours,

W. R. MCADAM,
Assistant Surgeon, U. S. M. H. S.

The suitability of Tortugas for an ideal quarantine station has been set forth by more facile pen than mine, still your attention is invited to the following table of vessels treated for the last four years, exemplifying the growing importance of the station:

Vessels treated in the year 1895-96:

Disinfected.....	46
Inspected.....	32
Total.....	78

Vessels treated in the year 1896-97:

Disinfected.....	50
Inspected.....	12
Total.....	62

Vessels treated in the year 1897-98:

Disinfected.....	48
Inspected.....	9
Total.....	57

Vessels treated in the year 1898-99:

Disinfected.....	86
Inspected.....	11
Total.....	97

In this connection it must be borne in mind that this station was practically closed during the war with Spain, thus materially reducing the number of vessels calling at this station for disinfection.

Hospital relief was furnished during the year as follows:

Yellow fever—United States Volunteers, 1; American seaman, 1; foreign seamen, 4. Enteric fever—United States Army, 1. Dengue—United States Navy, 1.

Beri-beri—foreign seaman, 1. Dysentery—United States light-house tender, 1. Faecal accumulation—United States light-house tender, 1. Catarrhal inflammation intestine—foreign seaman, 1. All recovered.

Trying situations frequently confront a quarantine officer, and at best his duties are onerous, commensurate with the importance of his station and the conscientious discharge of his duty. The presence on this station of the employees of the Union Bridge Company, the Alabama Dredging and Jetty Company, and of the Babcock & Wilcox Company, in connection with their respective operations, under the auspices of the Navy Department, militates most strongly against strictness of quarantine, and adds greatly to the difficulties and responsibilities of the officer in charge.

Laborers have been required to submit to disinfection of effects and the usual period of detention before leaving the station; officers are restricted to daylight communication with disinfection of effects (invariably) before departing, at the discretion of the commanding officer. The presence of an infected vessel renders detention obligatory. In view of the establishment of a coaling station at this point by the Navy Department, the question naturally arises as to the advisability of maintaining the quarantine station here. In our opinion the station can be maintained without interfering with the operations of the Navy and without relaxation of quarantine.

The coal sheds erected here will scarcely be used in time of peace, except in individual instances during the winter maneuvers (open quarantine season) of the fleet, while in war the station would be closed for quarantine purposes anyhow. Of course a force of 20 to 30 men would have to be permanently stationed here, but these can safely be quartered in properly constructed buildings on the sand spit outside the moat wall. In fact, such recommendation has already been made by the engineer in charge of the present improvements.

As an offset to this, the dredging of the inside channel to a depth of 30 feet makes it possible for steamers of any size to approach our wharf, while naval vessels can come from either direction and coal at one or the other of the sheds now building without passing in front of the quarantine wharf.

Repairs and improvements.—During the fiscal year but few improvements have been made, due to the practical closure of this station during the late war with Spain. The most important was the erection of a small hurricane-proof hospital for isolation on Burd Key, at a cost of \$1,088.

The efficiency of the disinfecting plant has been materially increased by the addition of one formaldehyde generator for the steam cylinder, and two autoclaves, at a total cost of \$355. The boiler on wharf has been provided with new stay bolts, at a cost of \$67.80 for labor and material. New gaskets have been put on the doors of the steam chamber, at a cost of \$12 for labor. The lead gaskets were already on hand, having been purchased the preceding year.

New injector for boiler, \$21.53; hose and couplings, \$160.50.

During the year the quarantine schooner *Glazier* has been docked twice, at a total cost of \$92.

Minor repairs to *Glazier*, \$4.80.

The naphtha launch was provided with a new piston rod, at a cost of \$27 for rod and labor.

The interior of medical officer's quarters and steward's quarters have been painted. In addition, the quarantine schooner, station boats, and machinery on wharf have been painted as often as necessary, labor by station force, costing \$378.50 for materials.

During the year there have been purchased one refrigerator, \$9.31, and one cooking stove, \$15. Total for repairs and improvements for fiscal year ending June 30, 1899, \$2,231.44.

In addition to the above-mentioned improvements, at the expense of the Service,

the northeast sand spit has been dredged away by the Navy Department, making a straight channel in line with the front of quarantine wharf, thus rendering it possible to safely dock any vessel likely to call at this station.

Very respectfully,

TALIAFERRO CLARK,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

GULF QUARANTINE; LOCATION, SHIP ISLAND, MISS.; POST-OFFICE
ADDRESS, BILOXI, MISS.

Report of the medical officer in command, Surg. P. C. KALLOCH. (Assumed command under official orders of December 28, 1898.)

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

GULF QUARANTINE STATION, *October 10, 1899.*

SIR: I have the honor to present the following report of transactions at the Gulf Quarantine Station during the fiscal year ended June 30, 1899:

The number of vessels disinfected, as shown by the inclosed schedule, was 210. The number inspected and passed, 119. During the quarantine season the inspector at the west end of Ship Island has inspected vessels from ports against which there is no quarantine.

Seven vessels arrived having had yellow fever in the port of departure, during the voyage, or both, or in quarantine. One vessel from Colon reported a death from chagris fever during the voyage, and three were ill in quarantine of the same disease.

One vessel, in addition to having a case of yellow fever, had a case of leprosy, in a Chinaman, who had been employed on the vessel two years.

Three Norwegian barks had beriberi in members of their crews, but none of them bedridden. These vessels were from Para and Bahia.

New construction.—An appropriation in sundry civil bill approved July, 1898, provided for a new steam launch, \$4,000; additional buildings for quarters, \$3,500; noninfectious hospital, \$15,000; isolation hospital, \$800; transfer barge and ballast lighter, \$2,000.

Of these improvements, the transfer barge and ballast lighter were built by Frank Tultavull, of Biloxi, and were ready for use at the beginning of the present quarantine season. They were well made and in accordance with the contract.

Of the other improvements provided for, the steam launch has been built, but not yet delivered, and the other new construction has not been started, owing to the lack of initiative in the office of the supervising architect.

Repairs.—A small building, heretofore used as a sail loft, was sealed and partitioned on the inside and weather boarded outside to make sleeping quarters for crews of vessels in stormy weather, at a cost of \$176.

The hospital was painted outside one coat lead and oil, and the roof one coat of metallic brown. The roof gutters were repaired and minor repairs were made to the buildings and walks by attendants.

The barge *Zamora* for disinfecting purposes received some needed repairs to the disinfecting apparatus last spring, including a new boiler. The hull, however, is so badly worn as to make a new barge or other means of disinfecting necessary. The exposed position of the anchorage makes it seem probable that a wharf would be less useful than a floating plant. An appropriation for the former has been made; the question as to the best method to pursue is under consideration by the Bureau.

The steamer *Welch*, used for towing the barge, and occasionally for other purposes, needs some repairs before she will be able to begin another season.

Respectfully, yours,

P. C. KALLOCH, *Surgeon, M. H. S.*

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

GULF QUARANTINE STATION, *July 24, 1899.*

SIR: In accordance with paragraph 644, Regulations Marine-Hospital Service, I have the honor to report the following repairs and improvements made at this station during the fiscal year 1898.

The items, with cost, are as follows:

Old wooden structure converted into sleeping quarters for the crews and captains of ships	\$176.00
Materials for painting the principal buildings exteriorly, the labor being performed by the attendants	80.00
Roof gutters were repaired where worn out	68.57
For lumber, to repair buildings, walks, and decking of wharves, including the flooring of a tent for west end station	30.42

Respectfully, yours,

P. C. KALLOCH, *Surgeon, M. H. S.*

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

SAN DIEGO QUARANTINE, SAN DIEGO, CAL.

Report of the medical officer in charge, A. A. Surg. W. W. MCKAY.

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

SAN DIEGO QUARANTINE STATION,
San Diego, Cal., September 13, 1899.

SIR: I have the honor to forward herewith, for annual report, the transactions of this station for the fiscal year ending June 30, 1899. During this period the number of vessels inspected from foreign ports was 154; none were detained. There is, however, likely to be a great change in the very near future, as with the inauguration of the new passenger service of the California and Oriental Steamship Company, and the new Central and South American Line in operation, so that this station is likely soon to take rank in importance on this coast, as has always been predicted of it. These lines of steamers are bound soon to make this port the principal gateway to Chicago, the middle West and Atlantic coast ports, for certain products and travel to and from the Orient; also for Oriental passengers bound for points in Mexico, as the great Santa Fe route via San Diego makes a saving in time between these points of nearly three days.

The following repairs and alterations were made at the quarantine station: The quarantine launch has been supplied with a new 20-horsepower Hercules gas engine, together with all necessary electrical auxiliaries. The engine is, perhaps, one of the finest of its type ever turned out of a shop on this coast. It carries a 36-inch four-bladed bronze propeller wheel, the blades being 11 inches in width. The engine is capable of turning this propeller up to 274 revolutions per minute, which gives the launch a speed of 12 miles an hour and great towing power for a boat of her size. The engine has been in use now for a year and gives perfect satisfaction, being considered superior to steam in every way for this sized launch and for this locality.

The engine, electric auxiliaries and their installation, together with the necessary alterations made in the launch, cost \$1,600; the sewer under the wharf in the water was repaired at a cost of \$110.

A formaldehyde apparatus was placed on the steam disinfecting chamber, the work being done by the station engineer; an autoclave (portable) was also supplied for use in the application of formaldehyde gas in the disinfection of state-rooms, etc.

The cost of both apparatus and materials for their installation was	\$300.00
Twelve new porcelain-lined iron laundry tubs were placed in the station laundry at a cost of	283.00
A new telephone line was constructed by the employees of the station; cost of materials	158.00
For water pipe and fittings for storage reservoir, pipe to be laid by employees of the station; cost of material	431.06
For barrels and materials for platform for carbolic-acid solution	21.00
For materials and repairs to steering gear of launch	25.25
For materials for painting small boats and launch	26.25
For repairs to heating apparatus in buildings	7.50
For paints and paint materials for painting inside of steam disinfecting chamber and outside of sulphur furnace	4.95
For paint and materials for painting the tin roof of kitchen and porch of hospital	3.20
Total	2,970.21

Respectfully, yours,

W. W. McKAY,
Acting Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

SAN DIEGO QUARANTINE STATION,

San Diego, Cal., July 10, 1899.

SIR: In accordance with instructions contained in paragraph 644, Regulations United States Marine-Hospital Service, I have the honor to forward herewith a detailed statement of the repairs and improvements made at this station during the preceding year:

Repairs to sewers	\$110.00
For new 20-horsepower engine in quarantine launch	1,600.00
For formaldehyde apparatus to steam chamber and for autoclave	300.00
For barrels and for materials for platform for carbolic-acid solution	21.00
For materials for painting tin roof of kitchen and porch of hospital	3.20
For new porcelain-lined iron laundry tubs for laundry	283.00
For repairs to steering apparatus of launch	25.25
For materials for repainting and repairing boats	26.25
For materials for construction of new telephone line	158.00
For material (water pipe) and for construction of reservoir	431.06
For material for painting inside of steam chamber and outside of sulphur furnace and smokestacks	4.95
For repairs to heating apparatus	7.50
Total	2,970.21

Respectfully, yours,

W. W. McKAY,
Acting Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

SAN FRANCISCO QUARANTINE, ANGEL ISLAND, CAL.

Report of the medical officer in command, Surg. J. J. KINYOUN. (Assumed command under official orders of April 27, 1899.)

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

SAN FRANCISCO QUARANTINE STATION,
Angel Island, Cal., September 1, 1899.

SIR: I have the honor to submit the following report of the transactions of this station during the year ending June 30, 1899:

Eight hundred and seventy-two vessels subject to quarantine inspection were inspected; of these, 12 were disinfected. Five of this number were disinfected on account of a quarantinable disease having occurred thereon (smallpox, 4; plague, 1), and the remainder at request of the War Department on account of typhoid fever, measles, and cerebro-spinal meningitis.

The number of persons inspected was 64,943; of these, 33,185 were of the crew and 31,758 were passengers. Six thousand six hundred and seventeen Chinese and Japanese steerage passengers were bathed and their effects disinfected. The personnel of 2 vessels was held in quarantine on account of smallpox.

Repairs and improvements.—The buildings are in a fair state of preservation. The lazaretto (hospital) building, the detention barracks for cabin passengers, and the quarters occupied by the steward have been painted. Minor repairs have been made to the barracks for Chinese and Japanese. Several changes and improvements have been made to the water supply; the boiler and pumps have been removed to the boiler room of the disinfecting house, and a new 3-inch suction pipe laid from the cistern and spring to the pumps. This change in the pumping system is a great improvement over the former method, inasmuch as the pumps and other machinery are concentrated at one place, and the water can now be pumped into the distributing tanks at the same time the disinfecting apparatus is in operation. This not only dispenses with the services of an engineer, but is also a great saving of fuel.

The special appropriation of \$3,700 for disinfecting apparatus has been applied in the following manner: Proposals have been obtained and forwarded to the Bureau with recommendations for acceptance for—

Steam disinfecting chamber for the hulk <i>Omaha</i>	\$975
For disinfecting shed	1,840
Bichloride tanks and pipes	440
Baggage barrows	55

In amount an aggregate of 3,300

leaving a balance of \$400, with which it is proposed to complete the baths on the hulk *Omaha*, to purchase lumber and material for covered passageway from the wharf shed to the disinfecting house, and to extend the roof of the latter so as to provide additional shed room.

My immediate predecessor, Surgeon Brooks, has already noted the necessity for the repair of the wharf. About one-half of the piles are eaten away by the teredo. Several of the stringers and supports are in a rotten condition. Its present condition is dangerous and must needs be repaired at as early a date as is possible. Besides this, the proposed disinfecting shed can not be erected until it is repaired.

During the past year it has become necessary to make a considerable number of repairs to the vessels belonging to the station. The boarding tug *Sternberg* has been overhauled and repaired. The cost of the repairs, including the service of an extra boat for boarding during the time required for the repairs, was \$2,160. While the *Sternberg* is in fair condition and bids fair to be serviceable for a long time, it is

ily adapted for a boarding boat in this bay. The vessel is too top-heavy and slow, rendering it extremely difficult to board incoming vessels without risk of injury, or, as it often occurs, not being able to overtake a vessel against a strong ebb tide. Passed Assistant Surgeon Rosenau has previously recommended that a new and faster boat be provided, a recommendation in which I heartily concur.

The launch *Bacillus* has been repaired to the extent of \$315. The boat is in fair condition, but will soon require repairs to be made to the boiler and machinery.

New tubes have been supplied the boiler on the hulk *Omaha*, as well as some minor repairs to the disinfecting apparatus. The disinfecting chambers have been, to some extent, modernized by the attachment of a vacuum apparatus and a formaldehyde generator. While these attachments are great improvements, the chambers are still in need of extensive alterations. Before disinfection can be done properly a new system of piping will be required, together with cars and tracks, which will not cost less than \$1,000.

A local telephone line connecting the several buildings has been established. This has been a great aid in the administration of the station. If the system could be extended to the military post and thence to San Francisco, it would serve still a better purpose.

Owing to the increased work of the station, I can hardly see how the service can be maintained unless communication by telegraph or telephone be established with San Francisco, and particularly with the boarding tug. A cable has been on several occasions recommended to be laid from Angel Island to Tiburon on the mainland opposite the station; but even if this was done it would leave a distance of 5 miles, over which a cable would have to be laid before connection could be made with the telephone system.

If an arrangement could be effected whereby a wire in the military cable could be utilized either for telegraphic purposes or for a telephone, it would be the best solution. A telephone line would be, of course, preferable.

Needs of the station.—The following is a brief summary of the most urgent needs of the station:

Repairs to wharf, estimated	\$5,200
Covered passageways from wharf to bath houses and disinfecting house ..	500
Extension of shed 62 feet; addition to shed already authorized	2,000
Extension of disinfecting house 25 feet	500
Concrete pavement around bath house and wharf building	500
For extension of fence about buildings	300
For additional facilities for hospital purposes	1,000
Repairing roadways	150
Crematory	1,500
Electric-light plant	10,000
Additional accommodations for cabin passengers	10,000
For providing an adequate water supply	5,000
Heating apparatus for buildings	2,000
For grading grounds and protection of water front from encroachments of the sea	5,000
For an iron pier or floating disinfecting plant	100,000
Total	143,650

The wharf, as before mentioned, is sadly in need of repair, and must soon be put in good condition or a serious accident may result. In view of the fact that the station will have to deal with the majority of the returning troops as well as the steerage of the trans-Pacific steamers the wharf should be repaired as soon as possible. Besides the necessity for its repair for landing persons thereon it must needs be repaired before the contemplated disinfecting shed can be erected on it.

It is to be regretted that the amount of funds available for the disinfecting shed was not sufficient to extend the buildings the full length of the wharf rather than one of the dimensions of 26 by 100 feet. As the shed will not be more than large enough for unpacking and arranging baggage, etc., for the disinfecting process, a similar space should be provided for repacking and storing these after disinfection. It is therefore recommended to extend the proposed shed the full length of the main wharf. Covered passageways should extend from the building on the wharf to the bath houses and disinfecting house. During the rainy season the necessity of such coverings are more than apparent.

The building in which the disinfecting machinery is located is barely large enough to cover it, and leaves but little working space at either end of the steam chambers. When a considerable amount of baggage is to be handled it can not be done expeditiously unless a greater part of the operation is conducted out of doors. If the weather is inclement, as it most usually is during the winter, disinfection of baggage is not an easy task. The building should be extended at least 25 feet on either end, so that the disinfected articles could be handled and packed under cover, and a place provided for the storing, if need be.

The space around the wharf, boathouse, and disinfecting house should be graded and covered with a layer of concrete pavement or asphaltum, preferably the latter. During the dry season the whole of this space becomes very dusty, making it extremely disagreeable, as well as soiling fabrics, etc., which have been disinfected. When it rains this space becomes a mass of mud, and it is out of the question to preserve a semblance of cleanliness, or preserve the first principles of sanitation. It is highly important from the latter point of view that this space in particular be so prepared as to prevent soil infection, and the surface be disinfected.

Inclosures should be erected around the wharf, bath, and disinfecting buildings; also around the buildings used for detention purposes. At present there are no facilities for separating persons and their effects who are to undergo disinfection from those who have been treated. Nor are there any means for separating the several classes of persons who may be undergoing detention. The only way which this can be attempted, and is imperfect at best, is in reliance upon a guard, which is too often an uncertain quantity. If selected attendants could always be assigned to guard duty, and these armed with a legal authority, fewer inclosures would answer. I am inclined to place more reliance in a well-constructed barbed-wire fence than to trust to a temporary guarding force. A good fence, augmented by a few trustworthy attendants, will keep people within due bounds.

There is only one hospital building which is used now for contagious diseases. This building must serve for all the quarantinable diseases, which in my humble judgment would not be proper; moreover there are no facilities for the care and treatment of persons ill with noncontagious maladies. Some provision should also be made for this class as well. The present hospital building should be used as a noncontagious hospital, and new buildings for contagious diseases be erected in more isolated places, and separate buildings be erected for the treatment of smallpox, cholera, yellow fever, and plague. This building is located practically in the center of the reservation, and is surrounded on three sides by buildings. Its central location and prominence of position reminds one very forcibly of the Venetian style of quarantine.

The roadways are in sad need of repair. These should be graded, drained, and then surfaced with macadam. If a small rock breaker was supplied, the rock could be prepared by the force at the station,

My predecessors have frequently made recommendation for a crematory for incineration of bodies dead of an infectious disease. The need for this is so apparent that I feel that it is unnecessary to do more than again invite attention to the matter and add my recommendation to that of my predecessors.

An electric-light plant is also needed. The present method of lighting the buildings and grounds by kerosene lamps is not only unsatisfactory, but dangerous as well. The buildings are constructed of wood, several of which are close to one another; and should fire break out in any one of these, would lead to their total destruction. It is next to impossible to prevent the Chinese and Japanese steerage passengers from tampering with the lamps, and on account of their lack of knowledge of the danger from lamps and our inability to make them understand, so far, increases the danger. The buildings should be provided with incandescent lights, and the ground, wharf, and wharf buildings with arc lights of about 500 candle-power each. It is believed that the station can be lighted within the amount estimated.

The accommodations for cabin passengers are entirely inadequate, and are poorly arranged for caring for persons of this class. Four large rooms, with two barrack buildings and the cottage, furnish the accommodations. Not more than 70 persons can be placed in them, and this crowds them to the utmost. These would, however, accommodate only 50 if the rules of hygiene were observed. The chief objection to the buildings is the lack of privacy. Instead of the large rooms, small apartments sufficient for two persons would be far more satisfactory, both from an administrative and hygienic standpoint. The present barrack building, in which the office is located, could be remodeled and additions made thereto, so that accommodations for at least 150 persons could be had. This should be done as soon as possible. The accommodations for the Chinese steerage passengers are poor and inadequate; they are unsanitary, and are death traps in case of fire. A fireproof barrack should be substituted for these. The shore lines should be extended in the cove to a line drawn from the corner of the boathouse to that of the Japanese barracks, and filled in from the side of the hill where the present barracks are located. This would provide ample space for a fireproof barrack building, as well as remove this class to a more isolated space, wherein they could be managed far better than under the present arrangements.

As it will be but a short time before it will become imperative to protect the shore line by a sea wall, it will be an easy as well as an inexpensive plan to extend the sea wall as before mentioned, and add this space to the reservation, and at a place where it is so much needed.

The water supply of the station is wholly inadequate. Attempts have been made from time to time in the past to provide a sufficient quantity of water, but so far it has been only partially successful. A small spring located in the head of a large ravine furnishes a small quantity. So also do both the large cisterns and a spring located in the rear of the laundry building. The continued drought of the past two years has compelled us to bring water from San Francisco. The U. S. quartermaster's tug *McDowell* has been, so I am informed, delivering 36,000 gallons a week. This will have to continue until the winter rains. The plan which was recommended by Passed Assistant Surgeon Rosenau seems to be the most feasible—that is, to sink a large well down to the bed rock, and by means of a drift made at right angles to the flow of the water to form a reservoir of capacity ample to supply the needs of the station. Test wells have been sunk above the large cistern, which seem to indicate that the plan is not only feasible, but will furnish all the water required.

Hot-water heating apparatus should be installed in the barrack building and the officers' quarters. The present method of heating the barracks by means of stoves increases the danger from fire.

Considerable grading and ditching is required on the grounds, particularly around the buildings.

A new road should be made along the ravine to the boundary of the reservation and there connect with the military road.

The shore line should be rippedraped with large stone, so as to prevent further

encroachments of the sea, and will when done furnish an additional area of space where needed.

An iron pier or floating disinfecting plant, sufficient in size and equipment to expeditiously handle the largest vessels, is needed. It appears, when all things are considered, that a large iron pier would be best suited for the needs of the station. Just where such a pier should be located remains to be determined.

My immediate predecessor, Surgeon Brooks, informs me that considerable annoyance is still caused by the State and city quarantine officers, who board vessels coincident with the quarantine officer's visit. This has been patiently borne until up to the present with the hope that this interference would soon be brought to an end, when the State courts should decide the question of the rights of the State to maintain an inspection after it has been superseded by Federal authority. This has not been passed upon, but is confidently expected at an early day. There has been an attempt by the city board of health, acting in conjunction with its quarantine officer, to make considerable trouble in the matter of quarantining the steamship *Nippon Maru*, which was placed in quarantine on June 29 on account of plague occurring previous to the arrival. This will be a subject in the next report, when a detailed account will be given.

Respectfully, yours.

J. J. KINYOUN,
Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

NATIONAL QUARANTINE SERVICE AT SAN FRANCISCO.

DEPARTMENT ACTION TO PREVENT BOARDING OF VESSELS BY UNAUTHORIZED PERSONS BEFORE PRATIQUE IS GIVEN BY THE NATIONAL QUARANTINE OFFICER.

The following letter and telegram are self-explanatory, and it is only necessary to add that subsequent to your telegram of August 23, 1899, there has been reported no attempt on the part of unauthorized persons to board vessels before pratique is given by the national quarantine officer, and the regulations in this respect are complied with:

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., August 23, 1899.

SIR: I inclose herewith a copy of telegram (inclosure 1) received from the national quarantine officer for the port of San Francisco, Cal., showing interference in the performance of his duties by the local quarantine officer.

On account of marked deficiency in quarantine appliances and the entire absence of a fixed quarantine establishment and because of inefficient examination of vessels at San Francisco, and acting under the provisions of section 3 of the act of Congress approved February 15, 1893, an officer of the Marine-Hospital Service was detailed by the President May 17, 1897, to assume charge of the quarantine of San Francisco Harbor.

I inclose a copy of a letter bearing the signature of the Secretary of the Treasury and of the President making this detail (inclosure 2). The present national quarantine officer, Surgeon Kinyoun, Marine-Hospital Service, has been detailed by direction of the President, succeeding the officer who was first detailed. Since 1897 the local quarantine officer has been ignored, and though he has claimed the right to board vessels and charge a fee therefor, this right has been resisted by vessel owners, and in a suit brought by the local quarantine officer against masters of certain vessels to collect his fees the defendants have been sustained by the courts, although I believe an appeal has been taken.

After the action by the President, as above mentioned, an attempt was made by

the local authorities to still exercise quarantine prerogative by requiring the postmaster at San Francisco to disinfect certain mail which the United States quarantine officer at San Francisco declared to be unnecessary. Acting under advice of Bureau letter of June 26, 1897 (inclosure 3), the First Assistant Postmaster-General declined to disinfect this mail.

As further illustrating the attitude of the Department, I inclose a copy of a letter (inclosure 4) addressed to the secretary of the health department of San Francisco, declining to order the collector of customs and other officers of the Government at San Francisco to submit the bills of health of vessels from foreign ports to State and local health authorities for inspection.

In spite of the status of the national quarantine officer, as fixed by the action of the President and as emphasized by the above-mentioned action of the Department, it now appears from the telegram of Dr. Kinyoun that the local quarantine officer boards vessels while the inspection by the national officer is still being conducted, and he gives permission to other unauthorized persons to go aboard the vessel also. This is in violation of article 1, paragraph 4, page 25, United States Quarantine Regulations, which reads as follows:

"No person except the quarantine officer, his employees, United States customs officers, or agents of the vessel, shall be permitted to board any vessel subject to quarantine inspection until after the vessel has been inspected by the quarantine officer and given its discharge."

There can be but one quarantine officer recognized by the Department at San Francisco. Therefore the action of the local officer in himself boarding a vessel and bringing other unauthorized persons with him before the vessel has been given its discharge by the national officer is not only illegal but renders negative the efforts of the latter. This condition of affairs should be immediately terminated.

The bubonic plague prevalent in Asiatic cities having communication with San Francisco and the large number of troops returning on transports make the quarantine service at that port at the present time a particularly difficult one, and the national officer should be free from this interference.

Unfortunately no fines or penalties have been provided in the national quarantine law which can be imposed upon these transgressors. Therefore the only available means of accomplishing the desired end are those suggested in the telegram, inclosure No. 1, namely:

The detail of customs guards at time of inspection—the Revenue-Cutter Service to assist if necessary—to prevent the boarding or leaving of the vessel by unauthorized persons, including the local quarantine officer, until pratique has been given.

I inclose herewith a telegram prepared for your signature to the collector of customs, containing instructions to the above effect.

I inclose also clippings from the San Francisco Chronicle of August 14 and the Sacramento Record-Union of August 14, showing the trend of public sentiment in California with regard to this matter.

Respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

THE SECRETARY OF THE TREASURY.

[Telegram.]

WASHINGTON, August 23, 1899.

COLLECTOR CUSTOMS, SAN FRANCISCO:

You are instructed, when called upon by the national quarantine officer. Surg. J. J. Kinyoun, to detail customs guards for vessels arriving for quarantine inspection.

tion. Allow none to leave or board vessel without Dr. Kinyoun's permission until vessel is discharged from quarantine. Use revenue cutter if necessary.

L. J. GAGE, *Secretary*.

COLUMBIA RIVER QUARANTINE; POST-OFFICE ADDRESS, ASTORIA, OREG.

Report of the medical officer in command, Asst. Surg. HILL HASTINGS. (Assumed command under official orders of April 28, 1899.)

REPORT OF TRANSACTIONS, REPAIRS, AND IMPROVEMENTS DURING 1899.

COLUMBIA RIVER QUARANTINE STATION,

Astoria, Oreg., October 16, 1899.

SIR: I have the honor to transmit herewith the report of the transactions of this station for the fiscal year ended June 30, 1899, as directed by Bureau letter, G, September 29:

Congress appropriated \$30,000 July 1, 1898, for the establishment of a quarantine station at the mouth of the Columbia River. In the fall of the same year a board, of which Surg. D. A. Carmichael, M. H. S., was chairman, was ordered to inspect the available sites for the establishment of the station, with the result that the property of an abandoned cannery, belonging to the Eureka and Epicure Packing Company, was selected. The selection was approved by the Bureau. The price agreed on was \$8,000. Pending the examination of the titles to this property by the Department of Justice, temporary arrangements were made in May last for emergencies requiring disinfection. The inspection of all vessels entering the Columbia River was instituted by the Bureau May 12, in accordance with the regulations of the Treasury Department. The following report is, therefore, for the forty-nine days remaining in the fiscal year ended June 30, 1899:

Number of vessels inspected	5
Number of vessels passed	3
Number of vessels held for disinfection	2
Number of oriental immigrants arriving	482
Pieces of baggage disinfected	376

Of the two vessels held for disinfection both were oriental liners from Hongkong. On each the baggage of immigrants was disinfected with formalin and the steerage compartments washed out with bichloride of mercury, 1 to 1,000. On one, the steamship *Columbia*, a case of smallpox had been disembarked at Moji, Japan. The disinfection was done on this account and as a preventive measure against the introduction of plague, which was epidemic in Hongkong. For the latter reason the other oriental liner was similarly treated.

Equipment for disinfection.—The apparatus temporarily in use consisted of 2 large force pumps, worked by hand, 2 men to each pump, capable of throwing a good stream of bichloride solution. Formalin, 40 per cent aqueous solution, was the gaseous solution used. A formalin autoclave was ordered by the Bureau.

Boarding vessel.—A small tug, the *Electric*, well housed in on account of the rain and stormy weather, was leased until a boarding vessel could be built. The owner of the boat made certain changes necessary for use as a quarantine vessel. The hull of the boat was painted white and the stack a buff color. A crew of 3 men, captain, engineer, and deckhand, was appointed by the Secretary of the Treasury. They were required to provide themselves with the uniforms of their respective rank in the quarantine service; and, in addition to their duties on the boat, were trained to assist in the work of disinfection.

An office was rented in Astoria, upon authority of the Bureau, at \$10 per month, heat, light, and water included.

The rent of the *Electric* was at the rate of \$200 per month at first, later at \$150 per month. No boat worth buying could be found, and it was recommended as best and cheapest to have a suitable boat built for use as quarantine boarding vessel. The boat desired should be a strong little tug, wood hull, well housed in, and capable of speed of 13 miles an hour. A detailed description of such a boat was the subject of a previous communication. The estimated cost of a boarding vessel is \$10,000.

The proposed station.—The property selected for the quarantine station is situated directly across the river from Astoria in the State of Washington. The distance from Astoria is 6 miles; the distance from the station to the quarantine anchorage in the main ship channel is 7 miles, while to the mouth of the river is about 12 miles.

The property consists of $4\frac{1}{2}$ acres of land, on which there are several frame houses, formerly occupied by the superintendent of the cannery and his employees; and, over the water, two large frame buildings and several smaller ones, constructed on a large wharf, constitute the cannery proper. The dock extends out to deep water. The depth at low water is 23 feet. The channel, which connects 10 miles below with the main channel, is narrow, but offers a safe anchorage. The shore property is on fairly level ground, although immediately behind this small tract of land steep hills covered with an almost impenetrable forest, rise abruptly until, a short distance inland, a height of 300 to 400 feet is reached. There are no roads, and no means of communication other than by water, except for a plank walk built on piles and uprights leading to a saw mill three-fourths of a mile farther up the river, at Knapton. At this place there are some 10 to 15 small houses. There are no other habitations, except a few fishermen's huts, up or down the river from the quarantine station for miles, and none at all inland. The bank of the river is so rugged and precipitous that the construction of a road up or down the river has never been attempted. The property is well watered by two bold little mountain streams that come down out of the hills and flow through the cannery grounds into the river. The water from another stream, outside the property, is confined in a small wooden reservoir up in the hills, and from this pipes convey an inexhaustible supply of good water to the buildings on the dock and to the main residence. The latter is situated in a fine orchard of about 1 acre in extent. From the property there is a fine view of the river and the distant mountains, but the view of the mouth of the river is unfortunately restricted by hills to the westward, rendering it impossible to be informed of the entrance of vessels until they have come well up the main channel on the other side of the river.

As to the improvements that must be made on the property I beg leave to quote from a previous letter as follows:

(1) The wharf is a large one and is in very bad condition. It is 450 feet long, 47 feet wide on the channel end and throughout half of the length, and 70 feet wide throughout the rest of the length. From the middle a wing extends, 100 by 70 feet, to the west. A plank walk, built on piles, connects the wharf with the shore. The piles throughout the wharf are rotten down to the water line, below which they are sound. They will need recapping. The wharf needs replanking throughout. To safely hold a vessel alongside the channel end (and there is not sufficient depth for a vessel to lie broadside to the wharf) will require a greater width than 47 feet, the present width. A wing "of new wharf will have to be built on the channel end, and should be 250 by 50 feet in dimension. To do this, rebuild the old and build this new wing, will cost in the neighborhood of \$7,500."

(2) As to the cannery buildings, one building, 100 by 30 feet, situated on the end of the dock, can be put in suitable condition for work of disinfection, installation of the steam chamber, etc., for about \$500. The main building, L-shaped, two stories high, is 150 by 60 feet along each link of the , and is badly in need of

repair. To put this in good condition will cost \$4,000. This will include (a) remodeling of the building so as to provide comfortable barracks for immigrants in the second story, which must be provided with new windows, and the walls, floor, and ceiling sealed; (b) construction of a bath house on the ground floor in one link of the L; (c) boiler and engine room, carpenter shop, and laundry in the other link of the L.

(3) As to the buildings ashore, very little can be done on the original appropriation without sacrificing necessary equipment for handling an infected vessel.

Repairs to quarters for attendants	\$200
Meager repairs to main residence	300

The latter is a large frame house of 12 rooms, that has been much neglected. It will serve temporarily in emergency for several purposes, but it would hardly pay to improve the building with the idea of making officers' quarters. It would be cheaper to build a small cottage for officers' quarters, and I would respectfully recommend that \$2,500 be appropriated next year for this purpose. In the meanwhile it is necessary for the quarantine officer to live in Astoria in order to keep informed of the arrival of vessels and be near by for boarding vessels, and it will only be necessary to live at the station when a vessel is quarantined there.

(4) As to disinfecting equipment, it is estimated that \$1,500 will furnish a steam chamber, sulphur furnace, etc.

(5) As for a hospital for contagious diseases, owing to the small amount of land in the property, it will be necessary to make temporary arrangements by constructing a small building on piles with a plank walk connecting it with the wharf. It is earnestly recommended that additional land be purchased in order that a safe lazaretto ashore can be built.

Very respectfully,

HILL HASTINGS,

Assistant Surgeon M. H. S., in Command.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

PORT TOWNSEND QUARANTINE, PORT TOWNSEND, WASH.

[Boarding station, Port Townsend; disinfecting station, Diamond Point.]

Report of the medical officer in command, Asst. Surg. M. H. FOSTER. (Assumed command under official orders of July 22, 1899.)

REPORT OF TRANSACTIONS DURING 1899.

PORT TOWNSEND QUARANTINE, WASH.,

October 30, 1899.

SIR: I have the honor to make the following report of the transactions of this quarantine station during the fiscal year ended June 30, 1899, as evidently desired by your telegram of October 28, 1899:

The total number of vessels inspected was 305, of which 111 were steam and 194 sailing. The crews of these vessels numbered 9,452, the cabin passengers 4,323, and steerage 1,491.

Two vessels were taken to the station, and 216 Asiatics were bathed and their dunnage and the compartments occupied by them and the oriental crew were disinfected.

Among the cabin passengers enumerated above were 431 Chinese and Japanese seeking admission into this country on local steamers running between here and Victoria, British Columbia. These were especially inspected, and all not showing signs of recent successful vaccination were vaccinated.

The larger number of steamers from the Orient coming to Puget Sound do so

by way of Victoria, British Columbia, and are disinfected there prior to entry, so that a strict inspection is all that is required at this port for their safe admission.

Respectfully, yours,

M. HUGH FOSTER,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT OF REPAIRS AND IMPROVEMENTS DURING 1899.

By P. A. Surg. J. C. PERRY.

PORT TOWNSEND QUARANTINE,
Port Townsend, Wash., July 20, 1899.

SIR: I have the honor to hereby report the following minor repairs and improvements made at this station during the fiscal year ending June 30, 1899:

A small house of two rooms has been built near the bath house for the purpose of providing a suitable place for keeping the money and valuables of passengers during their bath and disinfection of clothing, and to furnish a small air-tight room for disinfecting hats, shoes, and other articles of clothing that would be injured by steam, with formaldehyde gas. The rough plan transmitted will show the dimensions and general arrangement of this building. All the work was performed by the attendants, the cost of material being \$60.

An annex has been built to the bath house to provide space for steam and laundry tubs to facilitate the washing of clothing worn by those in quarantine. This is 22 by 12 feet, and the cost of material was \$50. All the fixtures for the installation of the tubs have been secured, but the latter work is not quite completed. A clothes rack, 25 by 35 feet, has been constructed, at a cost of \$5 for material.

A flag pole, 88 feet above ground, was secured and erected by the attendants, the only cost being that of \$25 for paint, ball, and halyards.

A fence 1,700 feet long has been constructed, partly of wire and rails, at a cost of only \$27 for barbed wire and spikes, as all the other material was secured and work performed by the attendants. This is a decided improvement, as it prevents the cattle and horses from roaming around the buildings and grounds.

A small house for the hose cart has been constructed, at a cost of \$30 for material.

The bath house has been raised and leveled, roof painted, and ventilator placed in roof, at a cost of \$25. Slight improvements and alterations have been made to the carpenter shop, and a partition constructed to provide a storeroom for unserviceable property, at a cost of \$20.

The following minor improvements have also been made: The grounds cleared and new roads constructed; new wire-screen doors and windows have been placed at the attendants' quarters; 18 ladders made, one for each building; partition constructed in loft of engine house, and trapdoor placed in ceiling over disinfecting chamber. The tank house has been cleaned, floor leveled, and portions of the walls ceiled. A tank for rain water, having a capacity of 800 gallons, has been constructed at the pump house and connections made so as to use rain water occasionally in the boiler. An unused cistern has been moved from the wharf to the attendants' quarters, and the necessary piping made for using the rain water in the kitchen. The total cost of material for the above improvements was \$50.

The sewer has been thoroughly repaired, bleeders have been placed on all pipes, new boxes made, and the manholes have been enlarged and cemented. Three new hydrants for fire purposes have also been constructed. This work has been done by the engineer, and the cost of material has been \$20.

Respectfully, yours,

J. C. PERRY,
Passed Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

REPORT ON BRITISH COLUMBIA QUARANTINE AT WILLIAMS HEAD.

By Asst. Surg. M. H. FOSTER.

PORT TOWNSEND QUARANTINE, WASH.,

November 17, 1899.

SIR: I have the honor to make the following report of my visit to the British Columbia quarantine at Williams Head for the ports of Victoria and Vancouver:

I arrived in Victoria Monday, November 13, 1899, and was hospitably received by Dr. Watt, the superintendent. We went down to the quarantine on Tuesday morning. A complete description of the station is found in Surgeon Brooks's report of his inspection made in 1898, and published in the annual report of the Service for that year. Various repairs and minor additions have been made since then, and the situation and plant are now all that could be desired. A reservation of 60 acres gives an abundance of room, and a sheltered harbor about 1 mile wide by 3 in length affords an excellent anchorage for vessels. There is also another harbor on the other side of the station that can be used for infected ships.

The steamship *Empress of China* arrived at noon, and I witnessed the usual method of procedure. The immigrants were inspected as they came off the boat and also a second time on the dock. All clothes and fabrics were disinfected by steam in the usual manner. All containers, trunks, and baskets which were empty were thoroughly wet with bichloride solution. All other articles—as hats, shoes, etc.—and trunks containing a few things spoiled by heat were put in the steam chamber and exposed to 20 per cent formaldehyde gas and 160° F. for one hour. In neutralizing the formaldehyde liquid ammonia gas was used, the cylinder in which it was contained being merely attached to the chamber by a small pipe and stopcock. Only about a minute is required to run in a sufficient quantity, and the method certainly recommends itself by its simplicity and rapidity. The people were all bathed with a solution of bichloride 1-2,000. Small rooms about 3 feet square, with a perforated pipe in each of the four corners and a shower bath overhead, were used for this purpose. The arrangement of pipes enables the solution to be thrown into the room in all directions; and as the patients are locked in the bath and the fluid turned on under high pressure from the outside for five minutes, they are sure to be wet from head to foot, and there is no possibility of shirking this measure. The steerage was also washed down with 1-800 bichloride. The entire process for the 320 Chinese took about eight and one-half hours.

Since the use of sulphur gas for a short time on articles damaged by steam has been abandoned for formaldehyde in the steam chamber, the disinfection now complies in all respects with our Treasury regulations.

Last year 122 vessels were inspected and about 12,000 immigrants treated.

On vessels coming to this port the Oriental crew is also disinfected by Dr. Watt in the same manner as the steerage.

The superintendent has always manifested a most friendly feeling toward this station and shown a willingness to comply in all respects with our requirements. The station is most admirably situated, is splendidly equipped, and the work is done conscientiously and energetically in all respects. I think we are very safe in accepting his certificate for any disinfection performed there.

Respectfully, yours,

M. HUGH FOSTER,
Assistant Surgeon, M. H. S.

SURGEON-GENERAL MARINE-HOSPITAL SERVICE.

AMENDMENTS AND ADDITIONS TO QUARANTINE REGULATIONS.

The following quarantine regulations were issued during the year as an additional safeguard against the introduction of smallpox and yellow fever from Cuba and Porto Rico:

AMENDMENTS TO QUARANTINE REGULATIONS—INSPECTION OF CERTAIN VESSELS AND BAGGAGE ON AND AFTER APRIL 1 AND UNTIL NOVEMBER 15.

TREASURY DEPARTMENT,
Washington, D. C., October 22, 1898.

To officers of the Treasury Department, State and
local quarantine officers, consular officers, and others concerned:

The following amendments to the quarantine regulations, to be observed at ports on the frontiers of the United States, are hereby promulgated:

Article II, paragraph 2, exception 1, is amended to read as follows: "Vessels arriving during certain seasons of the year, to wit, November 15 to April 1, may be admitted to entry."

Article II, paragraph 2, exception 2, is amended by striking out the words "November 1" and inserting the words "November 15" in lieu thereof.

O. L. SPAULDING, *Acting Secretary.*

ADDITION TO QUARANTINE REGULATIONS—DISINFECTION OF BAGGAGE AND EFFECTS OF SOLDIERS RETURNING TO THE UNITED STATES FROM CUBA.

TREASURY DEPARTMENT,
OFFICE OF SUPERVISING SURGEON-GENERAL M. H. S.,
Washington, D. C., March 4, 1899.

The following addition is hereby made to the quarantine regulations for the ports of the United States:

Article II, paragraph 6. All baggage and effects of soldiers from Habana and Cienfuegos arriving at any port in the United States south of the southern boundary of Maryland must be disinfected prior to vessel's entry. Soldiers' baggage and effects from all Cuban ports arriving at the above-mentioned ports in the United States after March 15, 1899, must be disinfected.

WALTER WYMAN,
Supervising Surgeon-General U. S. M. H. S.

Approved:

L. J. GAGE,
Secretary of the Treasury.

ADDITION TO QUARANTINE REGULATIONS TO BE OBSERVED AT FOREIGN PORTS AND AT SEA.

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, D. C., April 5, 1899.

To quarantine officers, masters of American vessels, and others concerned:

The following addition is hereby made to Article V, Quarantine Regulations, to be observed at foreign ports and at sea:

Paragraph 17. American vessels bound for the United States or for Porto Rico or for Cuba shall not ship men in ports of Cuba or Porto Rico where smallpox or yellow fever prevails, unless such men have been inspected and passed by the quarantine officer.

L. J. GAGE, *Secretary.*

QUARANTINE REGULATIONS RELATIVE TO THE DISINFECTION OF BAGGAGE AND PERSONAL EFFECTS FROM CUBAN AND PORTO RICAN PORTS.

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,

Washington, D. C., June 17, 1899.

*To medical officers of the Marine-Hospital Service, State and**local quarantine officers, collectors of customs, and others:*

In accordance with section 5 of the act of Congress approved February 15, 1893, and Executive order of January 17, 1899, the following regulations relating to baggage and personal effects shipped at Cuban ports for ports in the United States is promulgated. These regulations will be in force during the quarantine close season, which expires November 15.

1. Hereafter all baggage and personal effects, including hand baggage, of passengers leaving the island of Cuba shall be labeled by the quarantine officer at the port from which the vessel sails. The label shall bear either the word "Disinfected," or the words "Inspected and passed," or "Inspected and passed to northern territory."

2. All said baggage or personal effects destined for ports in the United States south of the southern boundary of Maryland shall be disinfected and bear the "Disinfected" label.

Baggage shipped through a southern port, but checked through to a point north of the southern boundary of Maryland, with such precautions as may be hereafter required to prevent its being opened en route, may be labeled "Inspected and passed for northern territory." But any such baggage presumably infected, or concerning which the quarantine officer at the Cuban port may feel in doubt, shall be disinfected.

3. All baggage, as above described, destined to ports in the United States north of the southern boundary of Maryland shall bear the label "Inspected and passed," or "Disinfected," as the case may be.

Baggage or personal effects bound for ports in the United States north of the southern boundary of Maryland, and whose ultimate destination is proven to the satisfaction of said quarantine officer to be a point north of the southern boundary of Maryland, and not intended thereafter to be shipped to a point south of the southern boundary of Maryland, may be labeled "Inspected and passed."

But if any such baggage is presumably infected, then, though bound to a northern port, it shall be disinfected, and any baggage bound for a northern port concerning which the quarantine officer may feel in doubt may, in his discretion, be disinfected.

4. It is further ordered that any baggage or personal effects from the island of Cuba arriving at any port in the United States during the season of close quarantine, April 1 to November 15, not labeled with either the "Inspected" or "Disinfected" label shall be disinfected at the quarantine station at the port of arrival.

5. The foregoing regulations will apply also to any port in Porto Rico should yellow fever appear in said port.

6. The quarantine officers in Cuba and Porto Rico, charged with the labeling of the baggage as above, shall exercise care and their discretion as to disinfecting all baggage coming from other ports or interior places.

L. J. GAGE, *Secretary*.

On April 24, 1899, the Treasury Department issued a circular to collectors of customs and others giving a list of all the United States consulates, and directing that report be made of any vessels arriving from a foreign port without a bill of health. There followed some misapprehension on the part of collectors concerning certain vessels

plying on the Great Lakes and adjacent waters. Accordingly another circular was issued August 16, 1899, amendatory to circular dated October 17, 1894, and extending exemption from the requirement of a bill of health to vessels from Canadian ports on the Great Lakes and other lakes. Following are the two circulars issued, but the list of foreign ports where consular offices are stationed is omitted herein:

CONSULAR BILLS OF HEALTH.

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, D. C., April 24, 1899.

To collectors of customs and others:

Circulars 106, 190, and 207 of 1894 are modified to read:

You are directed to notify this Department promptly of the arrival at your port of any vessel from a foreign port without consular bills of health as prescribed by the quarantine act of February 15, 1893, and to state the port of clearance of the vessel, and any ports of call, with the dates of each, number and class of passengers, general nature of cargo, and the present sanitary condition of the vessel as reported by the quarantine or health authorities for your port, together with the master's reasons for failure to produce the required bill of health, your judgment of their validity, and any circumstances essential for the guidance of the Department in considering the case.

The master's statement, or application, for relief from fine incurred should be made under oath and be subscribed by him and forwarded, through your office, with your report thereon.

United States consular bills of health are not required from any port where there is no United States consul or United States consular office.

A list, amended to date, of the foreign ports at which such officers are stationed, is printed below.

O. L. SPAULDING,
Assistant Secretary.

REGULATIONS REGARDING CONSULAR BILLS OF HEALTH FROM CERTAIN PORTS IN CANADA AND MEXICO.

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
Washington, D. C., August 16, 1899.

To the officers of the Treasury Department, consular officers, and others concerned:

Attention is hereby called to the following act of Congress, approved August 18, 1894, viz:

AN ACT to amend section 2 of the act approved February 15, 1893, entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section two of the act approved February fifteenth, eighteen hundred and ninety-three, entitled "An act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service," is hereby amended by adding to the end of said section the following:

"The provisions of this section shall not apply to vessels plying between foreign ports on, or near the frontiers of the United States and ports of the United States adjacent thereto; but the Secretary of the Treasury is hereby authorized, when, in his discretion, it is expedient for the preservation of the public health, to establish regulations governing such vessels."

Under the above act, vessels plying between Canadian ports on the St. Croix River, the St. Lawrence River, the Niagara River, the Detroit River, the St. Clair River, and the St. Marys River, and adjacent ports of the United States on the same waters; also vessels plying between Canadian ports on the following-named lakes, viz, Ontario, Erie, St. Clair, Huron, Superior, Rainy Lake, Lake of the Woods, Lake Champlain, and ports in the United States; also vessels plying between Mexican ports on the Rio Grande River and adjacent ports in the United States, are exempt from the provisions of section 2 of the act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service, approved February 15, 1893, which requires vessels clearing from a foreign port for a port in the United States to obtain from the consular officer a bill of health.

During the prevalence of any of the quarantinable diseases at the foreign port of departure, vessels above referred to are hereby required to obtain from the consular officer of the United States, or from the medical officer of the United States, when such officer has been detailed by the President for this purpose, a bill of health, in duplicate, in the form prescribed by the Secretary of the Treasury, Quarantine Regulations of the United States, 1894.

The circular extends the exemptions of Department circular of October 17, 1894, No. 161, Marine-Hospital Bureau, to vessels from Canadian ports on the Great Lakes; also Lake of the Woods, Rainy Lake, and Lake Champlain.

L. J. GAGE, *Secretary*.

NATIONAL QUARANTINE LAW.

The last Congress adjourned without taking final action on the two bills which had been introduced in the Senate and House of Representatives amending and materially strengthening the national quarantine law of 1893. Both of these bills are printed in the last annual report, together with the reports of the Senate and House committees, both of which reports strongly recommend the passage of the bills.

There was no further public discussion of these bills in the last session, but they failed to be brought up for final vote. It is difficult to conceive of any justifiable opposition to the measures contained in them, at least so far as maritime quarantine is concerned, and in view of the spread of bubonic plague in foreign countries there is a necessity of strengthening the national quarantine law in the manner provided by these bills, which have received the approval of the Department, as well as the House and Senate committees and it is proposed to again bring the matter to the attention of Congress.

DISINFECTING STEAMER SANATOR.

In connection with domestic maritime quarantine the following description of the very complete disinfecting steamer *Sanator*, as yet unassigned to any station in the United States, is of interest:

This vessel is believed to be the most complete and effective floating disinfecting plant in the world to-day.

Though unassigned, this vessel was constructed to meet emergencies which might arise at any port in the United States. At the

present writing it is probable that it will be needed in the harbor of Habana for the disinfection of vessels leaving that port for this country.

The description which follows was written at my request by C. M. Green, first assistant engineer, Revenue-Cutter Service, who was detailed by the chief of the Revenue-Cutter Division, with the consent of the Secretary of the Treasury, to superintend the construction of the vessel.

THE NEW DISINFECTING STEAMER SANATOR, UNITED STATES MARINE-HOSPITAL SERVICE.

By C. M. GREEN, first assistant engineer, Revenue-Cutter Service, superintendent of construction, M. H. S.

The control of new possessions and dependencies by the United States has made it necessary for this Bureau to greatly increase its appliances for preventing the spread of infectious diseases by disinfection of vessels, together with crews, passengers, and baggage, at all important ports, and especially Southern ports.

Such appliances have been gradually improving for some years, the energies of the Bureau being constantly directed to that end and the extended experience of the officers of the service making great advancement possible.

The successful and rapid disinfection of the returning troops and troop ships at Montauk Point in the fall of 1898 by means of the disinfecting barge *Protector* (then just completed) fully demonstrated the efficiency of a floating disinfecting plant capable of being removed from port to port and of rapidly and easily disinfecting large ships, with their passengers or troops and effects. Had no such apparatus been available at that time the spread of disease from the troops returning from Cuba might have been very disastrous, and although the use of the disinfecting barge was but little known to the general public, its completion and use on that occasion may almost be compared in fortunate results to the timely arrival and use of the *Monitor* in Hampton Roads during the civil war.

The Bureau is now fitting out for service at the port of Habana the disinfecting vessel *Sanator*, just completed by the Kensington Engine Works, at Philadelphia, Pa. This vessel was designed and constructed under the supervision of the Bureau, and is provided with the latest and most improved Kinyoun-Francis disinfecting and fumigating machinery, the whole plant being a decided improvement on the barge *Protector* and undoubtedly the most complete disinfecting vessel in the world.

The contract price for the vessel was \$56,700, the date of contract being January 3, 1899. Many improvements were afterwards made on the original design, causing changes which, together with the supplies and outfit, made the total cost of the vessel \$70,243.32.

The *Sanator* is a low-powered steam vessel, capable of making a maximum speed of about 8 knots, this being sufficient to enable her to reach her station and to move around the harbor as may be required.

Hull.—The hull is framed of Delaware oak, planked inside and out with yellow pine and decked with Oregon pine. The use of wood for the construction of the hull was necessitated by the fact that a steel hull is quickly corroded and eaten away by the solution of bichloride of mercury, which is one of the disinfectants used in considerable quantities on the vessel and which can not be kept out of the bilge.

The construction of the hull is very staunch and well suited for the purpose intended.



DISINFECTING STEAMER "SANATOR."

The dimensions are as follows:

	Ft.	in.
Length, over all	161	6
Length, from forward edge of stem to after edge of sternpost.....	149	11
Beam, extreme on water line.....	32	0
Depth of hold, from top of deck beams at side to top of ceiling at keelson..	12	0
Depth, from top of main deck beams at side to top of keel	13	3
Camber of deck beams.....	0	6
Draft, normal, forward.....	7	3
Draft, normal, aft	8	3
Displacement, normal, 640 tons.		
Displacement, 9.4 tons per inch at L. W. L.		
Distance, center to center of frames.....	0	26
Depth of keel below bottom planking	0	9

The keel (10 by 12 inches) is of oak in four sections with keyed scarfs secured by copper bolts. The keelson (10 by 16 inches) is of yellow pine scarfed in three sections. The frames are of oak, sided 6 inches and molded 12 inches at the throat and 6 inches at the deck. The deck beams are of yellow pine, sided 10 inches, 13 inches deep at the center and 7 inches at the ends. They are secured by hackmatack lodging and hanging knees well fastened. The bottom and inside planking is 3 inches thick and the top sides 4 inches thick. The clamps are 4 by 12 inches and 4 by 8 inch planking is carried from the clamps clear down to the lower turn of the bilge and 3-inch ceiling to the keelson. The deck is 3 inches thick, increased to 4 inches under the windlass and around the mast.

The frames are brought up through the plank-sheer and form stanchions for a heavy rail 31 inches above the deck and extending unbroken entirely around the vessel. There is a solid waist with a 1 $\frac{1}{4}$ -inch opening underneath and four freeing ports. A heavy guard extends entirely around the vessel at the sheer strake and the sides are kept clear so that other vessels can come alongside without damage.

The stem and apron are made of oak in one piece, sided 10 inches. A 15 by 15 inch oak towing bitt is located near the stem. The hawse pipes are very large, to provide for patent stockless anchors.

The sternpost is of oak, 12 by 17 inches at the propeller boss, and 12 by 10 inches elsewhere. The rudderpost is of oak, 10 by 12 inches. The rudder is 5 feet wide and fitted with heavy composition braces and pintles. The stock is 12 inches in diameter, of oak. The steering gear is of the double-purchase hand pattern.

There are the usual mooring chocks, cleats, rail chocks, etc. Bilge keels (8 by 10 inches) extending for a distance of 80 feet amidships are provided to reduce rolling in a sea way. The hull is coppered to a mean draft of 8 feet 6 inches.

The hold is entirely floored over 12 inches above the keelson, giving a large space for the reception of disinfecting and auxiliary machinery. At each end are raised platform decks to increase the floor space.

There are 2 cross bulkheads forming between them the infected compartment of the hold into which is taken all baggage, clothing, and effects to be disinfected. This compartment contains the forward ends of the two steam disinfecting chambers with the doors, cars, and tracks, and also a vat for bichloride of mercury for disinfecting certain articles by immersion in this solution. Above this compartment is a hatch 8 feet square from the main deck, and also clothes hatches from the two disrobing rooms in the deck house. This compartment is provided with lockers and racks, but is so built as to be easily disinfected or fumigated, as may be necessary, after infected goods are handled.

Forward of the infected compartment is another compartment, also provided with large hatches. This space contains the chain lockers, paint locker, sulphur bins, 2 large sulphur furnaces with smoke pipes, sulphur pipes, exhauster and

engine, 2 store-rooms, and 2 large fresh-water tanks, the latter being located under the raised flooring.

The space aft of the infected compartment is the largest compartment in the vessel. In its forward end are the 2 steam disinfecting chambers, with the formaldehyde gas and ammonia generators, the steam exhauster, cars, tracks, doors, and attachments. Goods, after being disinfected in the chambers, are brought through this compartment and taken up through the after hatch, which is 8 feet square. At the sides abreast of the steam chambers are 2 fresh-water tanks. Aft of these are 2 storage batteries for lighting purposes. This storage-battery system is believed to be the first ever installed in a vessel for the United States Government. Aft these are the ventilating blower and engine on the starboard side and the dynamo room on the port side. This latter room contains, besides the engine and dynamo, the switchboard and connections, and a tool locker. Next to the dynamo room is another large water tank, near which is located the steam fire pump. On the starboard side is an 1,800-gallon tank for bichloride of mercury solution, and near it a special steam pump connected to force the solution through pipes and hose connections to all parts of the vessel, or to a vessel alongside, as may be necessary.

Next to these tanks and outboard of the after hatch are the 2 single-ended "Scotch" boilers and outboard of these are 2 more water tanks. Next to these are the 2 coal bunkers, holding together 30 tons of coal. Between the coal bunkers is the main engine with its attachments and the main feed pump, the water service pump, the condenser, air and circulating pumps, and feed tank. On the raised platform aft are the pressure supply tank, oil tanks, lockers, work bench, and a large ice box and refrigerator.

On the main deck forward is a steam windlass for handling the anchors, and also arranged for working the 2 derrick booms. Aft there is a hand deck pump arranged for use as a bilge or fire pump. A side ladder, which can be shipped on either side of the vessel, is provided, and also a sea ladder.

Deck house.—The deck house, 24 feet 6 inches wide, extends for a distance of 99 feet, and has an extension at the after end 7 feet 2 inches long, on which is located the pilot house. It is divided into two parts, the quarters aft and the rooms for handling infected persons forward. A fore and aft bulkhead separates the forward part into two divisions, which may be used for males and females, as required. Infected persons are brought on board by the side ladder near the forward end of the deck house. They enter the forward or disrobing rooms, there being one on each side. Their clothing is lowered through the clothes hatches to the infected compartment of the hold, where it is sorted and disinfected, going through the steam chambers and up the after hatch. The persons being treated meanwhile pass from the disrobing rooms to the bathrooms immediately aft, where are 6 shower-bath rooms and 4 rooms each with a tub and shower. After bathing they go to the dressing room, where their clothing has been delivered after disinfection. They then pass to the waiting rooms, where they remain until taken ashore or to their vessel.

The after part of the upper deck is provided with awning and benches and can be used by waiting passengers in good weather, there being a stairway connecting it with the waiting rooms below.

The quarters for officers and crew in the after end of the deck house comprise a mess room, 9 staterooms, with 2 berths each, a galley, storage closets, and lockers. There are 2 water-closets in the after end of the house and 2 connected with the dressing rooms.

Besides the 18 berths in the stateroom, 38 berths are provided in the forward rooms of the deck house. These can be taken down and stowed under the transom seats in those rooms when not required. These berths are for use when passengers

are to be detained over night. Two of the staterooms can also be used for this purpose or for temporary hospital purposes.

The pilot house is placed on the extreme after end of the deck house in order to leave ample working space for the 2 derricks and the sulphur pipes and hose on the upper deck. The pilot house is provided with the usual hand-steering gear, binnacle, engine signaling apparatus, voice tubes, etc.

A single derrick mast, 63 feet 3 inches high above the main deck, is located midway between the two main hatches, and 2 booms, each 40 feet long, one for each hatch, are provided for handling baggage. These derrick booms are worked by the steam windlass and are designed to lift 1,500 pounds each. The mast is also provided with the necessary rigging for enough sail to keep the vessel out of the trough of the sea in case the machinery should become disabled while going from port to port. The sails and rigging are removed when the vessel is operating in port.

On the upper deck, in addition to the gear for the derricks, are the sulphur pipes, sulphur hose locker and the boats with their cradles, davits, and attachments, and also 3 skylights for lighting the rooms below.

Boats.—The boats carried are: One 25-foot alco-vapor launch, 2 18-foot dinghies. The launch is provided with a 5-horsepower alco-vapor engine and is very completely fitted out with all necessary attachments, awning, cork cushions, lines, and anchor. The dimensions of the launch are: Length, 25 feet; beam, 6 feet; depth, 2 feet 8 inches, and approximate draft, 25 inches. Its weight is 3,000 pounds when ready for service. This includes the weight of 40 gallons of kerosene, 8 gallons of alcohol, with all fittings, tools, and anchor. The launch is capable of a speed of about $7\frac{1}{2}$ knots, the propeller making about 265 revolutions per minute and the pressure being 80 pounds per square inch.

The 18 foot boats are provided with the usual outfit and also with masts and sails. The launch is carried in a cradle on the port side of the upper deck amidships and the two small boats on the same deck forward, davits and rigging being provided for each boat.

DISINFECTING MACHINERY.

Steam chambers.—These are two in number and are located side by side with their forward ends projecting through the bulkhead into the infected compartment of the hold. In shape they are cylindrical, being $60\frac{3}{4}$ inches in diameter outside and 16 feet long. Each is constructed with an inner and outer steel shell $1\frac{3}{4}$ inches apart, forming a steam jacket, the ends being riveted to heavy cast iron rings and the shells stayed with screw stays. The inner diameter in the clear is 55 inches.

At each end is a heavily constructed quick-opening door formed of a dished and flanged steel plate one-half inch thick. The flange of the door bears against a square rubber gasket fitted in a groove in the cast-iron end ring. The door is held shut by heavy steel radial arms bearing against an internal groove in the end ring and against blocks near the outer flange of the door, the inner ends of the arms being held in by a large nut and hand wheel working on a stud at the center of the door. An arrangement is provided for quickly withdrawing the radial arms from the groove in the end ring, thus permitting the door to swing open on a special davit and arm provided for the purpose. Ball bearings are provided in all parts, and although the door is heavy and designed to sustain a total pressure of about 38,781 pounds, it can be opened or closed in less than one minute.

The chambers are built to carry a working pressure of 10 pounds per square inch. They are covered with magnesia covering and are fitted with a complete system of steam and exhaust pipes, drains, and traps. A No. 6 Korting steam exhauster is connected with both chambers, which is capable of producing in either a vacuum of 15 inches in a very short time.

The drainage is led through two No. 1 Watson & McDaniel steam traps to two 295-gallon drainage tanks under the hold floor, these tanks being emptied overboard by a No. 4 Hayden & Derby steam ejector. Steam and vacuum gauges, safety valves, and thermometers are provided and two Watson & McDaniel 1½-inch reducing valves are fitted in the steam supply pipes to regulate the pressure. The steam inlet to the interior of the chamber is at the top and a copper hood extending the whole length of the chamber is provided to prevent steam impinging directly on the goods being disinfected.

Through each chamber near the bottom runs a double track of angle iron with movable extensions to transfer tables at both ends. Along these tracks can be moved cars of light wrought-iron construction containing the goods to be disinfected. These cars are provided with removable galvanized-wire trays, brass hooks, and galvanized-wire folding baskets, either of which may be used, depending on the character of the goods being treated. They are loaded with infected goods or clothing while on the transfer tables in the infected compartment and then pushed into the steam chamber, where the disinfection is accomplished. The after doors of the chambers are then opened and the cars brought out on the after transfer tables, where they are unloaded, the disinfected materials being taken up the after hatch. The cars are then moved outboard on the transfer tables and taken forward along raised tracks at the sides of the chambers and through doors in the bulkhead into the infected compartment, where they are again loaded with goods to be disinfected. The length of time of the operation depends upon various conditions, but usually occupies about thirty minutes for each chamber. Steam is kept in the jackets of the chambers during the operation so that the materials disinfected are thoroughly dried before being taken from the chamber. Four cars and 4 transfer tables are provided, as well as 48 wire baskets.

Formaldehyde apparatus.—Attached to brackets on the side of the starboard steam chamber is an apparatus for generating formaldehyde gas and ammonia gas. It is composed of two generators, one for each gas, secured in one cylindrical casing for compactness and convenience. Each generator consists of a horizontal closed cylinder containing a steam coil and provided with fillers, pressure gauges, safety valves, and proper pipe connections. The cylinder and pipes for formaldehyde gas are made of brass and copper, those for ammonia of cast steel and iron. Each is connected with both steam chambers, the purpose being to use formaldehyde gas for a disinfectant in either chamber when disinfecting any materials which would be injured by steam. The ammonia gas is used after the treatment by formaldehyde gas in order to neutralize the latter and prevent irritating effects on the mucous membrane from inhalation and contact with the goods treated. Either gas is generated by introducing into the generator the proper quantity (computing from the volume of the steam chamber) of formalin or a strong ammoniacal solution, as the case may be, and applying heat by means of the steam coil.

Before using either steam or formaldehyde gas in the steam chambers the air is removed by an exhaustor and a vacuum of about 15 inches formed.

Sulphur furnaces.—In the forward hold compartment are the two sulphur furnaces side by side athwartship. Each is built of steel with cast-iron fronts, the dimensions being, length, 10 feet; width, 3 feet, height to top of reservoir, 6 feet 6 inches. There is a fire box at each end of each furnace, over these being shallow cast-iron pans for the reception of the sulphur. Dampers and baffle plates are provided to regulate the supply of air and prevent too rapid combustion. On the top is a reservoir where the sulphur dioxide is collected. The smoke from the fire boxes is taken by a pipe near the bottom to a smokestack leading up through the main deck forward.

Pipes from the gas reservoirs connect to a high speed Sturtevant No. 5 monogram exhaustor, belted to a vertical engine having 5 inches diameter of cylinder, 6 inches stroke, and fitted with a governor. This exhaustor delivers the sulphur

gas through a 12-inch galvanized-iron pipe leading through the main deck to branch pipes extending fore and aft on both sides of the upper deck. On each of these branch pipes are three connections for special 6-inch sulphur hose by means of which the sulphur gas can be taken into any compartment of a vessel alongside to be fumigated. Five 20-foot sections of the 6-inch hose are provided, these being stowed in a hose locker on the upper deck.

The sulphur furnaces and sulphur piping below the main deck are well covered with magnesia covering, and the piping on deck is kept well clear of woodwork. The sulphur bins forward of the furnaces hold together 40 barrels of sulphur.

Bichloride of mercury apparatus.—An 1,800-gallon steel tank for the storing of bichloride of mercury solution is located in the hold amidships on the starboard side. Above this in the deck house is a 40-gallon mixing tank, with connections for steam and water as well as a connection to the large tank below. The proper quantity of the chemical is mixed in the small tank and allowed to flow into the large tank into which has already been pumped a quantity of water sufficient to make the required solution.

Near the large tank in the hold is a special Worthington horizontal duplex pump, having steam and water cylinders of $4\frac{1}{2}$ and $2\frac{3}{4}$ inches diameter, respectively, and a stroke of 4 inches, its water cylinder, valve guards, and connections being made of iron and the valves of rubber, it having been found that the bichloride solution acts less quickly on these materials than brass. This pump has suction connections to the sea, the bilge, and bichloride tank, and delivers to the same tank, to the bichloride pipe system or overboard. Its principal purpose is to take the solution from the tank and force it through the bichloride pipes to hose plugs located on the four corners of the deck house and to two hose plugs in the hold. By means of the 2-inch hose and spray nozzles the solution can be sprayed as a disinfectant in any part of the vessel or in any part of a vessel alongside being disinfected.

A bichloride vat is located in the infected compartment into which articles may be dipped for disinfection.

Bath and water-supply apparatus.—There are ten 10-inch showers and four porcelain-lined iron bath tubs (4 feet 2 inches by 24 inches inside) located in the ten bathrooms in the deck-house. These are supplied with water through No. 7 "Gegenstrom" water heaters, the latter being supplied with thermometers and steam and water regulating valves. The heaters are located outside the bathrooms and the temperature of the water is regulated by an attendant.

The water supply is provided by connections to a pressure tank (diameter 30 inches and height 5 feet 6 inches) located on the after hold platform. A Worthington horizontal duplex pump (size 3 by 2 by 3 inches), provided with an automatic regulating valve, supplies this pressure tank with fresh or salt water as may be required. The pump is so arranged as to maintain a constant pressure in the tank automatically. By means of a system of galvanized iron pipes this tank also supplies the nine wash basins in the staterooms and also the galley with fresh water.

The bathrooms and tubs are all provided with drains leading overboard, there being a 3-inch drain pipe on each side for this purpose. The wash basins in staterooms and galley sink are also provided with overboard drains.

The four water-closet flushing tanks, each holding 30 gallons, are supplied with salt water from the fire system and can be filled by either the deck pump or steam fire pump. The water-closet discharge pipes are of one-fourth-inch lead and discharge overboard just above the water line.

Autoclaves.—The vessel is to be provided with four Kinyoun-Francis autoclaves. These are portable formaldehyde gas generators, and can be taken into the cabins or rooms of a vessel alongside for disinfecting purposes, the rooms being tightly closed to prevent the escape of the gas.

BOILERS.

There are two single-ended "Scotch" boilers located in the hold outboard of the after hatch. The shell of each boiler is made up of two steel plates with longitudinal lap joints double riveted. Each has one cylindrical furnace stiffened by heavy rings and socket rivets. The combustion chambers are stayed to shell and back heads by socket rivets. The usual man and hand holes, dry pipe, internal feed pipes, and blow pipes are provided.

Each boiler is provided with 80 pounds of rolled zinc suspended from the longitudinal stay rods in iron baskets and making metallic contact with the stays. The tubes are of charcoal iron. A 3-inch Lynde spring safety valve, the usual gauge and gauge cocks, and a salinometer pot, is attached to each boiler. The uptakes are provided with two dampers for cutting out either boiler. The smoke pipe is 32 inches in diameter and extends 30 feet above the grates. It is provided with a casing 40½ inches in diameter where it passes through the house. A steam jet is connected at the base of the smoke pipe, and an exhaust nozzle is also provided, so that in case the engine is used noncondensing the exhaust can be made to assist the draft. The boilers are covered with magnesia covering.

Working pressure	pounds	110
Length, outside heads	inches	123
Diameter, outside	do	81½
Thickness of—		
Shell	inch	1½
Heads	do	5⁄8
Back tube sheets	do	1⁄2
Combustion chamber:		
Thickness of plates	do	3⁄8
Width	inches	24
Depth	do	57
Radius, inside	do	361½
Furnace:		
Thickness	inch	7⁄16
Internal diameter	inches	39
Length of grates	do	78
Tubes:		
Outside diameter	do	2¼
Length between tube sheets	do	92
Length as ordered	do	93½
Number in each boiler		120
Thickness B. W. G		12
Diameter of—		
Rivets in shell	inch	1½
Socket rivets	do	7⁄8
Number of longitudinal braces in each boiler		7
Diameter of same	inches	1¼
Heating surface, one boiler	square feet ..	594.59
Grate surface, one boiler	do	21.125
Area through tubes, one boiler	do	2.76
Diameter of stop valves	inches	4
Total for both boilers follows:		
Heating surface	square feet ..	1,189.18
Grate surface	do	42.25
Area through tubes	do	5.52
Area of smoke pipe	do	5.58

Ratio of heating to grate surface	28.14
Ratio of grate surface to area through tubes	7.64
Ratio of grate surface to area through smoke pipe	7.57

Feed pump.—This is located on the starboard side of the engine room and is piped to deliver to both boilers through the $1\frac{1}{2}$ -inch feed check valves. It is a Worthington horizontal duplex pump, having 6-inch steam cylinders, 4-inch water cylinders, and 6-inch stroke. Its suction is connected to the fresh-water tanks, the feed tank, the sea, and the bilge, and it can deliver to either boiler or overboard.

Injectors.—Two No. 6 Korting injectors are provided. Either injector can deliver to either boiler. The suction of one is connected to the feed tank and fresh-water tanks; that of the other to the sea and fresh-water tanks.

MAIN ENGINE.

This is a vertical, inverted, direct acting, condensing engine with independent pumps. It is designed to develop 200 indicated horsepower at about 130 revolutions. It is provided with a single-ported flat slide valve, "Myer" cut-off gear, and all the usual attachments, including relief valves, sight feed oiling gear, and revolution counter. The main steam pipe is provided with a large steam separator draining to the feed tank.

The engine cylinder is supported by two cast-iron columns, the guides being bolted to the columns and the crosshead being of the T type, with double crosshead pins. The bedplate is well stiffened and the thrust bearing bolts directly to it. The thrust bearing is of the horseshoe type, there being three collars forged on the thrust shaft.

The main exhaust pipe is provided with branches, gate valves, and a transfer valve so arranged that the exhaust can be led to the condenser, or, if it is desired to use the engine non-condensing, it can exhaust to the atmosphere through the escape pipe or through a nozzle at the base of the stack.

The shafting is of mild forged steel, with couplings and thrust collars forged on. The crank shaft is built up and its extension forms the thrust shaft. A spring bearing is provided for the intermediate shaft. The propeller shaft has composition sleeves shrunk on in the two stern tube bearings, the intervening part being provided with a water-tight covering. The stern tube is lined with lead, and the stern bearing is composed of a brass sleeve with lignum-vitæ staves. This bearing is fitted in a heavy casting bolted to the sternpost.

The engine is located as far aft as possible and takes up very little hold space.

	Inches.
Cylinder, diameter	17
Stroke of piston	20
Piston rod, diameter	$2\frac{1}{8}$
Steam ports, dimensions	11 by $1\frac{1}{2}$
Exhaust port, dimensions	11 by $2\frac{1}{2}$
Throttle valve, diameter, ...	4
Exhaust pipe, diameter	6
Connecting rod:	
Distance between centers	$61\frac{1}{2}$
Diameter of smallest part	$2\frac{3}{4}$
Valve stem, diameter	$1\frac{1}{4}$
Cut-off stem, diameter	$1\frac{1}{2}$
Eccentrics, throws of	$1\frac{1}{2}$
Cross-head pins (?), diameter	$3\frac{1}{2}$
Crank pin, diameter	$6\frac{1}{2}$
Crank shaft, diameter	$6\frac{1}{2}$
Thrust rings (3), diameter	12

	Inches.
Thrust shaft, diameter	6½
Propeller and intermediate shafts, diameter	6½
Shaft couplings:	
Diameter	14
Thickness	2½
Stern bearing:	
Length	18¾
Diameter	7¾

Propeller.—This is of cast iron of the Trout pattern. It is a true screw with dimensions as follows:

Number of blades	4
Diameter	inches 72
Pitch	do 88
Helicoidal area	square feet 15.5
Ratio of pitch to diameter	1.222
Ratio of helicoidal area to disk area	.55

Condenser, air, and circulating pump.—There is a combined condenser, air, and circulating pump of the Wheeler Admiralty type located athwart ship, aft of the engine. The exhaust of the main engine is led to the condenser and it also connects to the auxiliary exhaust pipe so that the auxiliary machinery of the vessel, as the dynamo engine, ventilating-blower engine, etc., can exhaust either to the condenser or through the escape pipe. The condenser and its pumps are of the usual construction for marine work, the condenser tubes being of composition tinned and the pumps being composition lined. The dimensions are:

Length of condenser over all	inches 95
Diameter outside of flanges	do 29
Tubes, diameter outside	do 4
Distance between tube sheets	do 82
Cooling surface	square feet 465
Pumps:	

Stroke	inches 10
Steam cylinder, diameter	do 7½
Air cylinder, diameter	do 9
Water cylinder (circulating), diameter	do 9
Diameter of suction and discharge pipes of circulating pump	do 5
Diameter of air-pump discharge pipe	do 3

The circulating-pump suction is connected to a 5-inch composition sea valve and also to a 5-inch bilge injection valve. A suction air chamber is also provided.

Feed tank.—This is a steel tank 4 feet 6 inches long, 18 inches wide, and 30 inches high. It is divided into 3 water-tight compartments by vertical plates. The feed water is delivered by the air pump into the end compartment at the top, passes down through the filtering material (excelsior), is taken from the bottom by a pipe leading to the top of the next division, and there the process is repeated, thus freeing the feed water of oil received from the engine and auxiliary machinery.

The feed tank is provided with overflow and drain pipes, water-tight covers, water-gauge glass, rolled zinc, etc., and is connected to the feed pump and injector suction pipe. The overflow pipe is so arranged that any water passing down it can readily be seen.

AUXILIARIES.

Fire pump.—This is a Worthington horizontal duplex pump, having steam cylinders 6 inches in diameter, water cylinder 5¾ inches in diameter, and a stroke of 6 inches. It is connected to draw from the sea through a 4-inch composition sea

valve and to deliver to the fire main, which has 2 hose connections in the hold and 4 at the 4 corners of the deckhouse. Racks are provided and arranged so that a section of hose with a nozzle can be kept connected up to each hose plug always ready for use. The fire pump is also connected to draw from any or all fresh-water tanks or from special hose connections, 1 on each side of the deckhouse, which, by means of 2 25-foot lengths of 3-inch suction hose, can draw from water boats alongside. The pump can deliver to all fresh-water tanks.

Tanks.—There are 7 large steel fresh-water tanks, not including the bichloride-of-mercury tanks and the various smaller tanks mentioned elsewhere. These 7 tanks hold in all 10,000 gallons of fresh water. Each is provided with manholes, baffle plates, water-gauge glasses, and the usual vents and pipe connections, the suction piping being 3 inches in diameter.

Electric-light plant.—In the dynamo room on the port side of the hold is located a Sturtevant direct-connected marine generating set of 6 kilowatts capacity. The engine is of the vertical, inverted, single cylinder, automatic-governing, high-speed type, having a diameter of 6 inches and a stroke of 6 inches. It is provided with a balance piston valve worked by a rock shaft with ball bearings from the eccentric and weighted governor in the fly wheel. It is fitted with the usual sight-feed lubricators.

The dynamo is of the compound-wound eight pole type. Carbon brushes are used. A field rheostat in an iron frame is provided to compensate for increased resistance by heating. The generator has a capacity for carrying 100 16-candle-power lights, and the voltage is kept at 110.

Near the dynamo is a slate switch board 4 feet wide, 5 feet high, and 1 inch thick. It is supplied with three Weston ammeters, one Weston voltmeter, and also connections for rheostats for dynamo and for storage batteries, circuit breaker, equalizers, ground detector, pilot lamps, and all the necessary switches for dynamo and batteries. The rheostat for the storage battery has sufficient range to control for from 10 to 70 lights, and no smaller number than 10 must be carried.

Storage battery.—A storage battery (constructed by the Electric Storage Battery Company of Philadelphia), consisting of 60 cells, is located in two special lockers, one on each side of the hold. The lockers are provided with 3-inch lead vent pipes to carry off the acid fumes. There are 30 cells in each locker. The battery has a capacity sufficient to carry fifty 16-candlepower 110-volt lights for ten hours after being charged. Its total weight is 5,900 pounds, including fittings. The weight of each cell filled is about 91 pounds, the dimensions being $8\frac{1}{2}$ by $8\frac{1}{2}$ inches and 10 inches high. The cells are placed in lead-lined wooden troughs or boxes, there being 15 cells in each. They are sealed to prevent the acid spilling when the vessel is rolling. Each of the lockers containing the cells measures 2 feet 8 inches by 7 feet 3 inches and is 6 feet 6 inches high.

Wiring and lamps.—There are twenty-five lights in the hold and forty-nine in the deck house and pilot house. Those in the forward part of the hold and deck house are in water-tight globes. Those in the quarters are fitted with shades and the portable lights are provided with wire guards. The wiring is in wood molding, well painted after being capped. The lights are divided into eight circuits, each circuit having a separate switch on the switch board. Switches are provided wherever necessary in the house wiring.

Ventilating plant.—This consists of a Sturtevant blower and high-speed engine, direct connected. The engine is vertical and has a cylinder of 44 inches in diameter and $6\frac{3}{4}$ inches stroke. The diameter of fan is 75 inches and its width 26 inches. A suction duct 38½ inches in diameter passes up into the deck house and takes air through a grating on the starboard side of the house. The delivery pipe from the blower is 31 by 29 inches. This has branches of galvanized-iron pipe extending to all parts of the vessel. A delivery pipe with louver is located in each room of the

deck house, and at intervals on both sides throughout all compartments of the hold.

The ventilating plant is designed to entirely renew the air in all parts of the hold every five minutes, the designed capacity of the blower being 12,000 cubic feet of air per minute when it is making about 260 revolutions per minute.

Steam windlass.—This is a No. 2 combined windlass and hoisting winch built by the American Ship Windlass Company. It is run by a two-cylinder vertical reversible engine, having diameter of cylinders 4 inches and stroke 6 inches. The drum shaft has, besides the two anchor chain wheels or "wild cats," a friction-driven hoisting-drum on the starboard side and a gypsy end on the port side. These are used for working the derrick hoists on the mast. The usual hand-brakes, chain-stoppers, and attachments are provided.

There are two Baldt stockless anchors, one weighing 1,236 pounds and the other 815 pounds. Each is provided with 60 fathoms of 1½-inch stud anchor chain, the weight of chain being 9,066 pounds in all. The anchors are stowed in the hawse-pipes.

Deck pumps.—A Gould double brake hand deck pump of the "Challenge" pattern is located on the main deck aft. It is double-acting with a diameter of 6 inches and a stroke of 5 inches. It is connected to draw from sea or bilge and deliver overboard or to the fire main. It is also connected to fill the water-closet tanks.

Bilge ejector.—A No. 5 Heyden & Derby steam bilge ejector is located aft of the engine, and is connected to draw from the bilge and deliver overboard.

Auxiliary steam and exhaust pipes.—On the starboard side just under the deck beams two lines of 3-inch pipe run fore and aft. One of these furnishes steam to all auxiliary machinery and the other takes the exhaust of all auxiliary machinery excepting that forward of the infected compartment. This auxiliary exhaust pipe is arranged to lead the exhaust to either the condenser, the escape pipe, or the nozzle at the base of the smoke pipe.

Galley.—The galley is provided with 6-hole galley stove, a sink and fresh-water connections, lockers, and all cooking utensils.

Outfit.—The vessel is provided with a fairly complete outfit of engineer tools and supplies for ordinary repairs, and with such cordage and deck supplies as would be necessary for ordinary operations. Such disinfecting materials as sulphur, formalin, and bichloride of mercury are carried in lockers provided for the purpose.

OPERATION OF STEAM CHAMBERS.

Steam disinfection.—(a) The chamber being cold, steam is admitted through the reducing valve to the jacket, care being taken to admit it very slowly at first to prevent sudden expansion and possible damage to chamber. Steam pressure must never exceed 10 pounds per square inch in either jacket or chamber.

(b) A proper temperature being obtained in the jacket (212 to 240° F.), the infected goods loaded in the car are pushed into the chamber, the doors are closed and made steam tight by means of the hand wheels.

(c) As soon as the temperature in the chamber is nearly as high as that in the jacket, the exhauster is started and a vacuum of about 15 inches produced in the chamber, the exhauster being then shut off.

(d) By means of the circulating pipes, steam is very slowly admitted to the chamber from the jacket, the pressure in the chamber gradually raising to equal that in the jacket.

(e) The circulating pipe valves are now shut off and operations (c) and (d) repeated, after which the goods in the chamber are left exposed to steam at about 10 pounds pressure for a period ranging from fifteen to thirty minutes depending on the character and compactness of goods being treated. The object of repeating operations (c) and (d) is to secure penetration and a high temperature (say

230 F.) in the interstices of the exposed goods by means of the transmission of heat by the moisture from the steam and the removal of air by the exhauster.

(f) After the exposure the steam is shut off from the chamber and the vacuum again produced, all steam and moisture being carried off and the goods being thoroughly dried by heat from the jacket.

(g) Air is then admitted by opening the exhauster discharge valve, the doors are opened, and the car and goods removed. No articles such as leather or books, which may be injured by steam heat, are exposed to this process.

Operation of formaldehyde disinfection.—In the retort marked Formalin is poured the desired quantity of the formalin mixture which is usually prepared under the following formula: 1,000 parts (by volume) of formaldehyde (H_2CHO) 40 per cent strength; 200 parts (by volume) of calcium chloride ($CaCl_2$); 400 parts (by volume) of water (H_2O).

The calcium chloride is dissolved in the water and filtered, after which the formaldehyde is added. This mixture is poured into the retort and all valves closed. To generate the gas the valve to the steam coil is opened and the heat will cause rapid vaporization. The pressure on the retort as shown by the gauge should never be allowed to exceed 40 pounds. When this pressure is nearly reached, the apparatus is ready for use.

The steam chamber being filled with goods to be treated with formaldehyde, and operations (a), (b), and (c), (as for steam) having been performed, the valve in the pipe connecting the formaldehyde retort to the chamber is opened very slightly (to avoid lifting the liquid in the retort by the vacuum in the chamber) and the gas is allowed to pass into the chamber until the pressure in the retort drops to nearly zero. The remaining liquid in the retort is again heated by the steam coil and, as before, when the pressure is nearly 40 pounds the gas is admitted to the chamber. It is usually necessary to heat the retort two or three times before the chamber is entirely filled with the gas.

The amount of formalin required can be computed by consideration of the volume of the chamber. One liter (61.0271 cubic inches) of formalin will evolve about 1,450 liters of the gas. The volume of one chamber is 435,951 cubic inches and that of the retort 1,526.64 cubic inches, the ratio being such that if the retort is one-fifth filled with formalin originally it will entirely fill the chamber with the gas, provided all the formalin is vaporized.

In case the goods being treated are such as would be damaged by a dry heat of more than 100 degrees (as leather goods) operations (a), (b), and (c) are so modified as to keep the temperature as desired; that is, only enough steam is admitted to the jacket to slightly warm it.

After the goods are exposed for the proper time to the formaldehyde gas (the time varying from ten to twenty minutes, according to the nature and density of goods being treated), the retort valve is shut off and operation (f) proceeded with.

Then ammonia gas from the ammonia retort is admitted to the chamber to neutralize the irrigating effects of the formaldehyde gas. Only a small quantity at low pressure is required. The method of operating the ammonia retort is exactly the same as that for the formalin retort excepting that commercial aqua ammonia is used. After exposure to this gas for about three minutes operation (f) is repeated and then operation (g) proceeded with.

HYGIENIC LABORATORY.

Following is the report of the acting director of the Hygienic Laboratory for the fiscal year ended June 30, 1899.

It has been determined to publish hereafter from time to time the results of the scientific work of the laboratory in special pamphlet

form and when thus printed they will be referred to but not reproduced in the annual reports as heretofore. In accordance with this plan a valuable report upon Formaldehyde Disinfection in a Vacuum Chamber, by P. A. Surg. E. K. Sprague, acting director of the Hygienic Laboratory, bearing date of September 18, 1899, was published in Public Health Reports of September 22, 1899, and subsequently in separate pamphlet form.

REPORT OF THE ACTING DIRECTOR.

SIR: I have the honor to submit the following résumé of work performed in the hygienic laboratory during the fiscal year ending June 30, 1899:

POTOMAC RIVER WATER.

During the month of July the investigation into the conditions of Potomac River water was carried on in the same manner as during the previous year. A joint report upon this work was submitted by P. A. Surg. J. J. Kinyoun and myself March 10, 1898. The results from that time were only confirmatory of the conclusions then offered (see report to the last Congress, Senate document 211), and the investigation, having covered a period of thirteen months, was discontinued.

Early in August the work of the laboratory was interrupted by the detail of its officers at Montauk Point, Long Island, for special temporary quarantine duty. During their absence the care of such routine as required attention was intrusted to Dr. William B. French.

STUDY OF THE BACILLUS TYPHOSUS.

In the report of the director of the hygienic laboratory for 1897 mention is made that a study of the bacillus typhosus is in progress. In endeavoring to increase the tolerance of a horse to intravenous inoculations with this organism in April, 1898, a quantity was administered that so impaired his physical condition that it became necessary to suspend the inoculations in order to allow him to regain his health. It was nearly six months before he was again in shape to tolerate the treatment. In October the work was resumed and continued for the remainder of the year. The results are embodied in a separate report.

EXAMINATIONS FOR OUR HOSPITALS.

At the beginning of the fiscal year a letter had been sent to the medical officers in command of United States marine hospitals requesting them to forward to the laboratory specimens of the viscera from each autopsy. Directions were given for preparing and mailing, and a copy of the necropsy report, together with a brief but concise history of the case was requested.

A cordial response was made to this letter and a large number of valuable specimens were received. The results of the examination were, in the majority of the cases, appended to the necropsy report for publication therewith.

The officers of the Service also frequently asked the assistance of the laboratory in determining the character of new growths. Numerous specimens of blood were received with the request that Widal's test for typhoid fever be applied, and a few samples of sputa were forwarded to be examined for tuberculosis.

Realizing that the value of such assistance to the officers depended in a great measure upon the promptness with which it was rendered, every effort was put forth to return the earliest possible report. Arrangements were made with the

Bureau to refer the letters accompanying the specimens directly to the laboratory, and a fresh culture of the typhoid bacilli was almost constantly on hand for the immediate application of Widal's test.

INSTRUCTION TO OFFICERS.

January 1, 1899, five officers of the Service detailed by the Surgeon-General began a course in clinical microscopy and bacteriology. It was recognized that the utmost that could be accomplished in the limited time assigned for instruction—three months—would be to so familiarize the students with microscopic and bacteriological methods and technique, that later they might be able to apply the knowledge acquired for the purpose of arriving at more accurate diagnoses. With that object in view they were first given a thorough course in chemical analysis and microscopical examination of urine. This was to a great extent review work, and consequently did not consume very much time. They were next instructed in the preparation of tissues for cutting and staining, and as soon as possible they began the study of normal structures. Having become familiar with these, a course in pathology followed, in which was included the diseases usually encountered, together with tumors.

The study of the malarial organisms was necessarily limited to the examination of specimens previously prepared. After the completion of the work upon tissues, the study of bacteriology was begun and carried far enough to acquaint them with the characteristics of the more common disease producing organisms. Special attention was devoted to methods of serum diagnosis, and they were instructed in the manipulation of X-ray machines, static and coil.

CEREBRO-SPINAL MENINGITIS.

During the winter and spring an epidemic of cerebro-spinal meningitis prevailed in the District of Columbia, and Dr. William B. French was appointed by the health officer to investigate the disease in this locality. Many autopsies were performed at which specimens of cerebro-spinal fluid, brain, and cord were obtained. A large part of this investigation was conducted in the laboratory, and a full report thereon has been prepared. It will be published in the Report of the Health Officer of the District of Columbia for 1899.

FORMALDEHYDE DISINFECTION.

Near the close of the year investigations were undertaken to ascertain the disinfecting powers of formaldehyde in a closed chamber, with the aid of heat and a partial vacuum. A separate report has been prepared and submitted upon this subject.

Respectfully,

E. K. SPRAGUE,

Passed Assistant Surgeon, M. H. S.

SERUM THERAPY OF TYPHOID FEVER.

By E. K. Sprague, Passed Assistant Surgeon, M. H. S.

Typhoid fever was one of the first of the acute infectious diseases in which serum therapy was employed, and while the results have not yet been altogether successful, they nevertheless have been of such a nature as to offer encouragement to investigators working for the production of a typhoid antitoxin.

Cases were first treated with serum obtained from patients convalescing from the disease, and, as might be expected in the use of so weak a serum, the results

reported were conflicting. Later, animals were inoculated with dead or living cultures of the typhoid bacillus or its toxins, and the sera thus obtained have been used in the treatment of the disease.

In 1894, Hughes and Carter (1) reported two cases of typhoid fever treated with serum obtained from a convalescent, and while immediate recovery did not occur, they thought the duration of the disease was considerably shortened, one being declared recovered in eighteen days and the other in twenty-one days.

Girard (2) reports a severe case in which dissolution appeared imminent, and to which 8 c. c. of serum from a convalescent was given. There were no immediate or striking effects produced, but the symptoms gradually improved and the patient recovered. The question of course arises whether or not the patient would have recovered without the use of the serum, but in the opinion of the attendant physician the results were in a great measure attributable to its use.

Legrain (3) in 1895 treated twelve cases with serum from convalescents in a severe epidemic. In his opinion the serum produced a decidedly favorable effect, its administration being followed by a reduction of temperature and disappearance of the nervous symptoms and a marked improvement in the general condition.

Silvestri (4) reports two cases treated with serum obtained from the blister of a convalescent typhoid patient, and with what he considered good results.

Von Jaksch (5), on the other hand, treated a series of cases with antityphoid serum from convalescents, and did not observe any benefit therefrom.

V. Jez (6) reports six cases treated with serum from convalescents, to which was added equal parts of hydrogen peroxide, with absolutely no beneficial effects, and this is not at all surprising when we consider the extremely delicate chemical organization of the antitoxins and the energetic action of hydrogen peroxide in the presence of dead organic matter.

Klemperer (7) and Levy treated five cases of typhoid fever with the serum of dogs immunized by subcutaneous injections of the typhoid bacillus, and while no crisis occurred after its use, all the cases ran a mild course, which the authors considered due to the use of the serum.

Pollak (8) reported eighteen cases treated with serum obtained from convalescents, in which the total amount administered in each case varied from 2 to 45 c. c. He thinks that mild cases may have been benefited by numerous injections. As a rule the temperature rose after the injection, and there was no immediate improvement. In one case collapse occurred as a result of the post injection hyperpyrexia. Leucocytosis was observed in the course of the treatment of nearly all the cases.

Weisbecker (9) reported two cases treated with serum from convalescents, in which a complete cure was accomplished within forty-eight hours. Serum was administered on the ninth day of one case and on the eighth in the other. In view of the results obtained by other observers and the fact that Widal reaction was not mentioned in connection with these cases, the accuracy of the diagnosis may possibly be called in question.

M. Chantemesse (10) prepared a toxin by growing the typhoid organism on bouillon made by digesting spleen with an acidulate solution of pepsin, neutralized with sodium hydrate, grown for six days. The culture was then filtered, and 1 c. c. of the toxin thus obtained was fatal for 80 grams of guinea pig in twelve to twenty-four hours. Subcutaneous inoculations of this toxin in the horse yielded a serum after two years 0.02 c. c. of which would save a rabbit if administered twenty-four hours before a fatal dose of toxin. If an immunizing dose of the serum was given and the following day living typhoid bacilli were injected subcutaneously, they were killed in seven hours. The serum is thus seen to have possessed both bacteriacidal and antitoxic properties. One case was treated with this serum with apparently good results.

The same writer (11) had previously reported two cases successfully treated with serum from a horse immunized to typhoid, in which there was a steady reduction of temperature, such as occurs in the abortive type of the disease.

MM. Lyonnette, Merieux, and Carré (12) obtained a serum from the horse with an agglutinating power of 1-33,000 by subcutaneous inoculations of living cultures of the typhoid bacillus. They maintained the virulence of their cultures by successive passages of the organism through the peritoneum of the guinea pig. They obtained a large number of bacteria, relative to the quantity of moisture, by evaporating a bouillon culture in an incubator (37° C.) in which was placed sulphuric acid and calcium chloride. Centrifugalization, 2,000 revolutions to the minute, failed to precipitate the bacilli, and evaporation became necessary for proper concentration. Considerable immunizing and some curative power has been claimed for this serum.

Cooper (13) reports a severe case treated with Burrough's and Welcome's serum, in which the injections were not made until the thirty-second day. Two doses were administered, and the claim is made that they saved what otherwise would have proved a fatal case. Dr. Dowson, director of the Welcome Physiological Research Laboratory, in a personal letter, has informed the writer that this serum is produced by subcutaneous inoculations into the horse of sterilized bouillon cultures of the typhoid bacillus. The best result which he has been able to obtain in the laboratory was to save a guinea pig, weighing 350 to 400 grams, from what otherwise would have been a fatal injection of typhoid bacilli, by the administration of 0.01 c. c. of the serum. The results obtained with this serum, as with all others, have not been altogether satisfactory, as will be seen from the following citations:

Pope (14) reports four cases treated with this serum, two of which appeared to be benefited. Fever was possibly lessened, but the cases dragged along and their course was not much shortened.

Steele (15) reports one case treated with this serum, the illness beginning February 10, 1897. Temperature was normal on the 25th; no subsequent rise; Widal reaction present; four injections were given, 10 c. c. each.

Basket (16) reports a case able to work May 17, 1899; May 18 the temperature was 105.1°. This case went from bad to worse, and on May 23, 10 c. c. of serum were administered and followed by marked improvement in all the symptoms. On the 25th a second inoculation of the same quantity was made, and the temperature quickly fell to normal and there remained. No Widal reaction was obtainable three weeks after the last injection. This throws some doubt upon the diagnosis, inasmuch as the administration of the antitoxin would tend to the production of this reaction.

Grünbaum (17) suggests that little dependence is to be put upon the Widal reaction for diagnostic purposes, if it is obtained after the administration of an antitoxic serum.

The sera which have hitherto been used in the treatment of typhoid fever have been produced by subcutaneous inoculations of either the cultures or the toxins. In view of the extensive tissue necrosis which is almost certain to occur after the subcutaneous introduction of a comparatively small quantity of typhoid toxins or bacilli, it was decided to attempt the immunization of a horse by intravenous inoculations. It was thought, too, that by the introduction of the living organism directly into the circulation the antitoxin-producing cells would be more vigorously stimulated than by any other method, and that a more potent antitoxin would thus be produced.

Accordingly, June 18, 1897, a horse, to which had previously been given mallein and tuberculin without reactionary effects, and to all appearances healthy, was inoculated in the right jugular vein with 20 c. c. of a 24-hour-old virulent bouil-

lon culture of typhoid previously heated for two hours at 60° C. Two hours later he was apparently very sick. He was found to be lying down in an unconscious condition, and he could not be aroused by any ordinary gentle methods. He soon recovered, and on the following day, although unable to eat and drinking large quantities of water, he was perceptibly on the gain. The jugular vein was easily rendered prominent by compression on the approximal side, and little difficulty was experienced at any time in inserting the needle. Occasionally the vein would be so wounded in the first attempts as to produce an extravasation and blood, and in case of such an accident the injection was usually made upon the opposite side. In only two instances were abscesses produced, and these were trifling in size and effect, neither one being larger than a walnut.

The injection apparatus consisted of a large-mouthed glass bottle of 250 c. c. capacity, into which was inserted a rubber stopper with two apertures. Into one of these was fitted a glass tube, to which was attached the bulb of an ordinary atomizer. Through the other aperture was passed a glass tube reaching to the bottom of the bottle, and to it was attached with a rubber hose a hollow needle. Care was taken to expel the air from the rubber hose and needle previous to its insertion into the vein, and then with pressure from behind the liquid was gently forced into the vein and the stopcock applied to the tubing to prevent the entrance of air. June 25, 1897, 5 c. c. of a suspension of dead typhoid bacilli, previously sterilized at 60° C., were injected. The reaction from the first injection was so profound that it was deemed expedient to reduce the dose. In order to determine approximately the quantity of bacilli present in 1 c. c. of the suspension, that amount was evaporated to dryness and the residue weighed. There was found to remain 0.0234 gram, which was reckoned as the weight of dead bacilli, although, of course, a certain quantity of salts were necessarily present; but it was at that time and later employed as a method of approximately determining the strength of toxins.

While the reaction following this inoculation was not as profound as in the first instance, it was estimated five days later that the animal had lost at least 50 pounds in weight. He soon began to gain, and on July 13 he was given 15 c. c. of a suspension of dead typhoid bacilli, obtained by the mixing of the surface growth of the organism on agar slants in sterilized distilled water. Previous to this inoculation 200 c. c. of blood were withdrawn, and the Widal reaction was found to be 1-100. Three more inoculations of dead bacilli were made in July and August. September 8 it was thought that it would be safe to administer a small quantity of a living culture intravenously, and accordingly the horse was given 0.1 c. c. of a living bouillon culture, 1 c. c. of which inoculated into the peritoneum of a guinea pig would produce death in twelve hours. This quantity of culture by the method previously mentioned was found to contain 0.309 gram of bacilli. This small quantity of culture was followed by practically no reaction, until, on the 25th, 2 c. c. were injected with only a slight reaction. Inoculations with living bouillon cultures were continued until November 16, when 15 c. c. were given. The Widal reaction at this time was found to be 1-3,000. It was considered unadvisable to administer a larger quantity of bouillon intravenously, and from this date the horse has received only living cultures taken from agar slants and suspended in sterile distilled water. November 23 he was given organisms obtained from 10 tubes, and this method was followed until March 31, 1898, when the maximum dose of 52 tubes was reached. February 13, 1898, Widal reaction was obtained at 1-20,000. After the administration of the large quantity mentioned it was thought for several weeks that the result of previous labor would be destroyed by the death of the horse. He lost his appetite, became greatly emaciated, and a large atonic ulcer appeared above the left hind hoof. There was no knowledge of previous injury, and it appeared that

there was tissue necrosis simply from lack of vitality. The left hock joint was swollen, hot, and tender, and he became so lame that he practically walked on three legs.

As late as June 12 some old ringbones became very tender, evidently causing much discomfort. In spite of every attention in the way of diet and care, the improvement was exceedingly slow and the lameness did not entirely disappear for five months. It was also feared that the reaction had been sufficient to destroy any power of resistance previously gained, and it was with considerable surprise that on August 15, 1898, we found the agglutinating power of the serum to be 1-100,000.

Wright and Semple (18), in the course of their experiments with typhoid vaccine, found that while the Widal reaction appeared almost immediately after the first inoculation the maximum reaction was not obtained until after a much longer period—two to five weeks: but the writer's experiments would lead him to the conclusion that the maximum reaction after the administration of large quantities of toxin was not obtained for several months, for on November 12, 1898, the agglutinating power of the horse's serum was found to be 1-200,000, and this with no inoculation after March 31, the work having been interrupted by the critical condition of the animal and by my enforced absence from the hygienic laboratory on special temporary duty.

December 12, 1898, a suspension of living typhoid bacilli from two tubes was injected into the jugular vein and, as had been expected, there was a decided reaction. From this time on varying quantities of the living bacilli have been given, but never enough to produce more than a temporary indisposition. April 21, 1899, it was found that the agglutinating power of the serum was 1-500,000, and while inoculations have been made occasionally since to maintain the immunity, the experiments which are about to be reported have all been made with the serum obtained at this date and with the above agglutinating power.

In the course of these inoculations several different organisms have been employed, all of which have conformed to the recognized cultural and morphological characteristics of *bacillus typhi abdominalis*. In maintaining the virulence of the organism considerable difficulty was experienced in preserving its purity in the successive passages through the peritoneum of guinea pigs; but no inoculations were given the horse with any organism that showed any evidence of contamination. Whenever contamination occurred that generation was thrown aside and a return made to one of recognized purity. In several instances the organism was abandoned altogether and treatment begun with a fresh culture. It was found that the organism could be kept pure much more readily by its successive passage through the right pleural cavity of guinea pigs, and this was the method most frequently employed to maintain its virulence. This method was found upon the whole very satisfactory, and only in one or two instances was difficulty experienced with contaminations.

The following table shows the date of inoculations, the quantity of culture, and the morning and evening temperature in detail. Wherever breaks occur in the record there was no deviation from the normal temperature curve.

A limited number of experiments have been performed in the laboratory to determine the curative and immunizing properties of the serum. One c. c. of the serum mixed with a lethal dose of typhoid culture and injected into the right pleural cavity was followed by death on the fifth day. Several other experiments of the same kind indicated that, under these conditions, the serum possessed slight, if any, curative properties. Better results, however, were obtained when we came to test its immunizing properties, inasmuch as $\frac{1}{100}$ of 1 c. c. administered twenty-four hours in advance of a lethal dose of virulent typhoid was sufficient to save the animal.

Intraperitoneally.

Weight of guinea pig.	Quantity of serum.	Agar culture (typhoid 24 hours later.)	Results.
<i>Grams.</i>			
530.....	0.1 c. c.....	1 ooze.....	Recovery.
540.....	0.05 c. c.....	do.....	Do.
440.....	Control.....	do.....	Dead after 48 hours.
550.....	0.05 c. c.....	do.....	Recovery.
535.....	0.02 c. c.....	do.....	Do.
500.....	0.01 c. c.....	do.....	Do.
470.....	Control.....	do.....	Dead after 24 hours.

In view of the limited number of animal experiments with this serum, it is suggested that those already performed should be repeated and that further experiments should be undertaken to ascertain exactly the full immunizing power of the serum, and, inasmuch as it is harmless to the lower animals, it might be well to try its effect upon a case of typhoid in the human. The earlier in the course of the disease the serum is administered, the more decided should be its effects. Ten c. c. could probably be injected subcutaneously, and repeated every twenty-four hours, until some improvement is noticed, or the conclusion had been reached that its further use would be of no advantage. In case it should prove of no avail in the treatment of the disease, this same horse, or another treated in the same manner, might be still further immunized to the infection by the administration of filtered or precipitated toxins. The writer, however, is of the opinion that the serum in its present state possesses decided immunizing properties and there is good reason to believe that its administration to human beings would be followed by an immunity to typhoid fever, such as is derived from other well-known sera in the case of their respective diseases. In its present state it is thought that its value lies in this direction, rather than as a curative agent, and it is to be hoped that an opportunity may arise for testing its protective value.

In conclusion, it should be stated that this work was begun at the suggestion of Surg. J. J. Kinyoun, at that time director of the Hygienic Laboratory, and the writer wishes to express to him his appreciation of his many timely suggestions and assistances in the conduct of the work.

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Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks.
			A. M.	P. M.	
1897. June 18	20 c. c.		37.5	39.2	24 hour old bouillon culture typhoid heated 2 hours at 60° C. 2 p. m. 20 c. c. of a 24 hour old culture bouillon heated for 2 hours at 60° C. were injected into the right jugular vein. 15.2061. 4 p. m. Apparently very sick. Lying down, unconscious, and can not be aroused by ordinary methods.
19			38.9	38.7	Better. Anorexia, very thirsty. Culture employed on the 18th sterile.
20			38.6	38.6	Appetite poor, but there is general improvement.
21			37.8	38.0	Appetite and general condition improving.
22			37.7	37.9	Gaining, but not up to par. Injected 17 c. c. dead culture heated 1 hour at 60° C., each c. c. of which contained 0.02 grams of dead bacilli prepared as before.
23			37.6	37.8	
24			37.6	37.7	
25	5 c. c.	0.0234 gm. to 1 c. c.	37.7	38.1	Appetite good, 0.117 grams dead bacilli.
26			39.2	39.6	Anorexia.
27			38.0	38.3	Appetite improving.
28			37.6	37.8	Appetite improving. Nearly well.
29			37.7	37.9	
30			37.8	38.0	Warm weather may produce slight rise of temperature.
July 1			37.6	37.8	Eating well. Has lost weight, 50 pounds.
2			37.7	37.8	
3			37.8	38.0	
4			37.6	37.8	
5			37.7	37.9	
6			37.6	37.8	
7			37.6	37.8	
8			37.7	37.8	
9			37.6	37.8	
10			37.6	37.8	
11			37.6	37.8	Has gained flesh for the past 10 days.
12			37.6	37.7	
13	15 c. c.	0.0155 gm. to 1 c. c.	37.6	38.4	0.2325 gram dead bacilli.
14			39.0	39.3	Anorexia.
15			38.4	38.8	Withdrew 200 c. c. of blood. Widal reaction, 1-100.
16			37.8	38.0	Appetite good.
17			37.7	37.9	Do.
18			37.5	37.8	Do.
19			37.6	37.8	Do.
20			37.5	37.7	
21			37.6	37.8	
22	17 c. c.	0.02 gm. to 1 c. c.	37.6	38.8	0.34 gram dead bacilli.
23			39.0	39.5	Anorexia. Very thirsty.
24			38.5	38.3	No passage from bowels. Kidneys O. K. Thirsty.
25			37.8	38.0	Appetite improving.
26			37.8	38.1	Appetite good.
27			37.7	37.8	
28			37.7	38.0	
29			37.7	37.9	
30			37.7	37.9	
31	8 c. c.	0.0438 gm. to 1 c. c.	37.7	38.0	0.3504 gram dead bacilli.
Aug. 1			38.0	38.1	Anorexia.
2			38.4	38.8	Small oedema at site of injection tender.
3			38.0	38.2	Appetite fair. Oedema about same.
4			37.8	35.2	Appetite good. Oedema slowly disappearing.
5			37.7	37.9	Do.
6			37.8	38.0	Do.
7			37.6	37.7	
8			37.5	37.6	
9			37.6	37.8	
10			37.6	37.7	
21	10 c. c.	0.04 gm. to 1 c. c.	37.5	37.8	0.4 gram dead typhoid bacilli.
22			39.0	39.6	Anorexia. Diarrhea.
23			38.0	38.3	Legs stocked. Appetite improving.
24			37.8	38.0	Do.
25			37.5	37.8	
26			37.6	37.8	Appetite good.
Sept. 7			37.6	37.9	
8	0.1 c. c.	0.003 gm. bacilli	37.7	38.0	Living bacilli 0.0609 gram to 1 c. c.
9			38.3	38.8	Slight oedema at site of injection.
10	0.3 c. c.	0.0309 gm. to 1 c. c.	37.9	38.4	0.01 gram living bacilli.
11			38.6	39.4	Appetite very little impaired.
12			38.3	38.8	

Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks.
			A. M.	P. M.	
1897.					
Sept. 13			37.8	38.2	
14			37.8	38.0	
15			37.6	37.8	
16	0.5 c. c.	0.0309 gm., 1 c. c.	37.5	37.9	0.015 gram living typhoid bacillus.
17			37.8	38.0	
18			37.5	37.7	Apparently no reaction.
19			37.5	37.7	
20	1 c. c.	0.0309 gm., 1 c. c.	37.5	38.0	0.0309 gram living typhoid bacillus.
21			37.4	37.7	
22			37.5	37.7	
23			37.5	37.6	
24	1 c. c.	0.0289 gm., 1 c. c.	37.4	37.8	
25	2 c. c.	0.0289 gm., 1 c. c.	37.5	38.3	0.0578 gram living bacilli.
26			38.2	38.4	Anorexia. Small oedema on abdomen.
27			38.0	38.5	Appetite returning. Oedema gone.
28			37.8	38.0	Appetite improving.
29			37.6	37.8	
30			37.6	37.8	
Oct. 1			37.5	37.7	
2			37.5	37.7	
3			37.5	37.7	
4			37.5	37.7	
5			37.4	37.6	
6			37.5	37.6	
7	3 c. c.	0.0289 gm., 1 c. c.	37.5	37.9	0.0867 gram living typhoid bacilli.
8			39.0	39.3	Appetite fair. Not very sick.
9			38.5	38.0	Appetite good.
10			38.2	38.3	
11			37.6	37.8	
12			37.5	37.8	
13			37.5	37.7	
14	4 c. c.	0.0289 gm., 1 c. c.	37.5	38.0	0.1156 gram living typhoid bacilli.
15			38.6	39.4	Appetite not much impaired.
16			38.0	38.3	
17			37.7	37.8	
18			37.6	37.7	
28	7 c. c.	0.0289 gm., 1 c. c.	37.6	37.7	0.2023 gram living typhoid bacilli.
29			37.9	37.8	
30			37.8	37.6	
31			37.6	37.7	
Nov. 1			37.6	37.7	Apparently no reaction.
2	3 c. c.		37.6	38.0	48 hour old culture.
3			37.8	38.5	
4			37.7	37.9	
5			37.6	37.9	
6			37.5	37.6	
7			37.5	37.6	
8	10 c. c.		37.4	37.8	Same culture as used on the 2d.
9			38.3	39.0	Poor appetite.
10			38.0	38.1	Improving.
11			37.9	37.8	
12			37.8	37.6	
13			37.6	37.6	
14			37.5	37.6	
15			37.5	37.6	
16	15 c. c.		37.6	38.0	Widal reaction 1-3,000.
17			38.6	39.0	Anorexia, bowels normal.
18			38.3	38.6	Appetite returning.
19			37.8	38.0	Appetite good.
20			37.7	37.9	Organism grown on agar slants for 4 days, then scraped off into sterile distilled water.
21			37.6	37.8	
22			37.6	37.8	
23	10 tubes.		37.5	38.0	
24			38.5	39.0	Anorexia.
25			38.2	38.7	Hind legs unsteady; appetite improving.
26			38.4	39.0	Appetite good.
27			37.8	38.0	
28			37.7	37.9	
29			37.6	37.8	
30	15 tubes.		37.4	37.8	
Dec. 1			38.3	39.1	Poor appetite.
2			38.0	38.4	Appetite improving.
3			37.8	38.0	Appetite good.
4			37.6	37.5	
5			37.6	37.7	
6			37.6	37.8	
7	15 tubes.		37.6	38.0	
8			39.2	39.1	Appetite poor.
9			38.3	38.4	Appetite improving.
10			37.8	38.0	Appetite good.

Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks.
			A. M.	P. M.	
1897.					
Dec. 11			37.8	38.0	Appetite good.
12			37.7	37.9	
13			37.6	37.8	
14			37.6	37.9	
15			37.6	37.8	
16			37.6	37.8	
17	20 tubes.		37.7	38.0	
18			38.0	38.2	Appetite poor.
19			37.8	37.9	Appetite good.
20			37.7	37.6	
21			37.7	37.7	Small abscess at site of injection. A few drops of the culture were forced into the peri-vascular tissues before the needle entered the vein.
22			37.8	38.0	Abscess disappearing.
23			37.6	37.6	
1898.					
Jan. 13			37.7	37.8	
14			37.6	37.8	
15	25 tubes.		37.7	37.9	
16			38.2	38.8	Appetite poor.
17			38.4	38.7	
18			38.0	39.0	Bled 2,500 c. c.
19			37.7	37.8	Appetite good.
20			37.6	37.8	
21			37.6	37.8	
22			37.6	37.7	
23			37.5	37.7	
24			37.7	38.0	
25	30 tubes.		37.7	38.0	
26			39.0	39.5	Appetite poor.
27			38.6	38.4	Do.
28			37.9	38.1	Appetite improving.
29			37.9	38.1	Appetite good.
30			37.7	37.9	Do.
31			37.6	37.6	
Feb. 1			37.6	37.7	
2			37.5	37.6	
3			37.5	37.6	
4			37.5	37.7	
5			37.4	37.5	
6			37.4	37.6	
7			37.5	37.6	
8	37 tubes.		37.4	37.6	
9			37.5	38.5	
10			38.6	39.0	Appetite poor.
11			38.2	39.3	Do.
12			37.8	38.5	Appetite improving.
13			37.8	38.0	Sheath greatly swollen.
14			37.8	38.4	Widal reaction 1-20,000.
15			37.8	38.0	
Mar. 15			37.5	37.6	
16			37.6	37.8	
17	50 tubes.		37.6	38.3	
18			38.3	38.8	Appetite poor.
19			38.2	38.8	Do.
20			37.8	38.0	Appetite returning.
21			37.8	38.0	Appetite good.
22			37.6	37.8	
23			37.6	37.8	
24			37.5	37.6	
25			37.5	37.6	
26			37.6	37.8	
27			37.6	37.8	
28			37.6	37.8	
29			37.7	37.8	
30			37.5	37.7	
31	52 tubes.		37.5	38.6	
Apr. 1			38.6	39.3	Appetite poor.
2			38.4	38.0	Do.
3			37.9	37.8	Very sick.
4			37.8	38.0	Appetite improving.
5			37.7	37.8	
6			37.6	37.7	
7			37.5	37.6	
8			37.4	37.6	
9			37.5	37.6	Horse in critical condition; great emaciation.
10			37.5	37.6	
11			37.6	37.8	
12			37.5	37.6	Appetite good.
13			37.6	37.8	

Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks.
			A. M.	P. M.	
1898.					
Apr. 14			37.6	37.7	
15			37.5	37.6	
16			37.5	37.7	
17			37.5	37.7	
18			37.7	38.0	
19			37.6	37.8	
20			37.6	37.8	
21			37.5	37.7	
22			37.6	37.8	
23			37.6	37.8	Ulcer large as hand above left hind hoof.
24			37.7	37.8	
25			37.6	37.8	
26			37.5	37.6	
27			37.4	37.6	Ulcer improving.
28			37.4	37.5	
29			37.4	37.6	
30			37.5	37.7	
May 1			37.6	37.7	Ulcer steadily improving.
2			37.7	37.9	Ulcer nearly well.
3			37.5	37.6	
4			37.6	37.8	
5			37.5	37.7	
6			37.5	37.6	
7			37.4	37.6	
8			37.4	37.6	
9			37.5	37.7	
10			37.6	37.8	
11			37.6	37.7	
12			37.5	37.8	
13			37.6	37.8	
14			37.5	37.7	
15			37.7	37.8	
16			37.6	37.7	
17			37.6	37.8	
18			37.6	37.8	
19			37.8	38.0	Left hock swollen, hot, and tender. Can hardly step on hoof. Appetite poor. This morning there was some swelling of the left hock, and it was so tender that he almost walked on three legs. By means of a long rope we hitched him out of doors where he could eat grass.
20			37.8	38.0	Bathing hock in turpentine liniment; some improvement.
21			37.8	37.9	Appetite improving.
22			37.7	37.9	Do.
23			37.7	37.8	Lameness nearly gone. Appetite much improved. Looks brighter than for some time past. Has all the grass he wants morning and night.
24			37.6	37.9	
25			37.7	38.0	Gaining flesh.
26			37.6	37.8	Stiff in joints even yet. Apparently disinclined to walk very much.
27			37.6	37.8	
28			37.7	37.8	
29			37.7	37.7	
30			37.7	38.0	
31			37.7	37.9	
June 1			37.7	37.9	
2			37.6	37.8	
3			37.7	37.9	
4			37.6	37.7	
5			37.6	37.7	
6			37.8	37.8	
7			37.7	37.9	
8			37.7	37.9	
9			37.8	38.0	
10			37.8	38.0	
11			37.7	37.9	Very lame in left fore leg.
12			37.7	38.0	Ring bones very tender.
13			37.7	38.0	
14			37.6	37.9	
15			37.6	37.8	
16			37.6	37.8	Gaining in flesh
17			37.6	37.9	Lameness not very much better.
18			37.6	37.9	
19			37.7	37.9	
20			37.5	37.7	
21			37.7	38.0	
22			37.5	37.8	
23			37.6	37.7	

Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks.
			A. M.	P. M.	
1898.					
June 24			37.7	37.8	
25			37.7	38.0	
26			37.6	37.9	
27			37.7	38.0	
28			37.7	37.9	
29			37.6	37.8	
July 1			37.7	38.0	
2			37.8	38.1	
3			37.8	38.0	
4			37.8	38.0	
5			37.6	38.0	
6			37.6	37.7	
7			37.6	37.8	
8			37.6	37.8	
9			37.8	38.0	
10			37.6	37.8	
11			37.5	37.6	
12			37.6	37.8	Still lame, but improving.
13			37.5	37.7	
14			37.6	37.8	
15			37.7	37.9	
16			37.6	37.8	
17			37.7	37.9	
18			37.8	38.0	
19			37.7	37.9	
20			37.7	38.0	
21			37.8	38.0	
22			37.6	37.8	
23			37.7	37.9	
24			37.6	38.0	
25			37.7	38.0	
26			37.8	38.0	
27			37.8	38.0	
28			37.8	37.9	
29			37.8	38.0	
30			37.8	37.9	
31			37.8	37.9	
Aug. 1			37.8	38.0	
2			37.7	37.9	
3			37.8	38.0	
4			37.8	38.1	
5			37.7	37.9	
6			37.5	37.8	
7			37.6	37.8	
8			37.6	37.8	
9			37.6	37.8	
10			37.5	37.6	
11			37.5	37.6	
12			37.6	37.6	
13			37.5	37.8	
14			37.7	37.9	
15			37.6	37.8	
Nov. 1			37.4	37.6	
2			37.5	37.7	
3			37.5	37.8	
4			37.5	37.7	
5			37.5	37.6	
6			37.5	37.6	
7			37.4	37.5	Withdrew 200 c. c. blood.
8			37.4	37.5	
9			37.5	37.7	
10			37.6	37.8	
11			37.5	37.6	Widal reaction, 1-200,000.
12			37.4	37.6	
13			37.5	37.6	
14			37.5	37.6	
15			37.5	37.6	
16			37.5	37.6	
17			37.5	37.5	
18			37.6	37.7	
19			37.5	37.6	
20			37.5	37.7	
21			37.5	37.7	
22			37.5	37.5	
23			37.4	37.5	
24			37.4	37.5	
25			37.4	37.5	
26			37.5	37.5	
27			37.4	37.5	
28			37.4	37.5	
29			37.5	37.6	
30			37.4	37.6	
Dec. 1			37.5	37.5	

Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks.
			A. M.	P. M.	
1898.					
Dec. 2			37.4	37.6	
3			37.4	37.6	
4			37.4	37.4	
5			37.6	37.8	
6			37.6	37.6	
7			36.4	37.6	
8			37.4	37.6	
9			37.4	37.6	
10			37.4	37.6	
11			36.4	37.8	
12	2 tubes		37.5	39.2	Typhoid organism from two large agar slants. Immediately after inoculation he lay down and exhibited by his uneasy action that he was very sick.
13			38.0	39.0	
14			38.2	38.4	
15			38.6	38.4	
16			37.6	38.0	Appetite was almost lost for a period of ten days and his legs were "stocked" during that time. In fact a most profound effect was produced.
17			37.8	37.6	
18			37.7	37.8	
19			38.3	38.2	
20			37.9	37.8	
21			38.0	37.8	
22			37.6	38.0	
23			37.8	38.0	
24			38.0	38.0	
25			37.6	37.8	
26			37.8	37.8	
27			37.4	37.6	
28			37.8	37.9	Appetite just returning.
29			37.4	38.0	
30			37.6	37.8	
31			38.0	37.8	
1899.					
Jan. 1			37.7	37.9	Appetite good.
2			37.4	37.4	
3			37.4	37.8	
4			37.6	37.7	
5			37.8	37.9	
Feb. 1			37.6	37.8	
2			37.6	37.7	
3			37.8	37.8	
4			37.5	37.7	
5			37.7	37.9	
6			37.7	37.8	
7			37.5	37.7	
8	3 tubes		37.5	39.4	Typhoid organism from agar slants.
9			39.0	38.6	
10			38.0	38.2	
11			38.0	38.1	
12			37.7	37.9	
13			37.7	37.8	
14			37.6	37.7	
15			37.6	37.8	
16			37.6	37.8	
17			37.6	37.8	
18			37.6	37.8	
19			37.5	37.6	
20			37.5	37.7	
21			37.5	37.6	
22			37.5	37.7	
23			37.7	37.9	
24			37.7	37.8	
25			37.6	37.7	
26			37.6	37.6	
27			37.5	37.8	
28			37.6	37.7	
Mar. 1			37.8	37.8	
2			37.6	37.6	
3			37.6	37.8	
4			37.5	37.7	
5			37.5	37.6	
6			37.5	37.7	
7			37.4	37.6	
8			37.5	37.6	
9			37.5	37.8	
10			37.5	37.7	
11			37.6	37.8	
12			37.8	37.7	

Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks.
			A. M.	P. M.	
1899.					
Mar. 13			37.7	37.9	
14			37.6	37.8	
15			37.6	37.7	
16			37.7	37.9	Withdrew 250 c. c. blood.
17	3 tubes		37.6	39.8	Ten days old.
18			39.4	37.7	Appetite gone.
19			38.7	38.0	Some stiffness in legs.
20			37.8	37.7	Appetite improving.
21			37.5	37.8	
22			37.5	37.8	
23			37.6	37.8	
24			37.6	37.8	
25			37.6	37.7	
26			37.6	37.8	
27			37.7	37.7	
28			37.4	37.7	
29			37.7	38.0	
30			37.8	37.8	
31			37.4	38.0	
Apr. 1			37.7	37.8	
2			37.7	37.9	
3			37.8	37.9	
4			37.7	37.9	
5			37.6	37.8	
6			37.6	37.9	
7	5 tubes living bacilli.		37.7	37.9	Withdrew 3.200 c. c. blood.
8			37.8	39.1	Stiff in legs.
9			38.0	38.2	Appetite poor.
10			37.8	38.2	
11			37.7	38.1	
12			37.5	38.2	Appetite good.
13			37.6	38.0	
14			37.8	38.0	
15			37.8	37.8	
16			37.7	37.8	
17			37.7	37.7	
18			37.6	37.8	
19			37.7	37.9	
20			37.6	37.8	
21			37.6	37.9	Widal reaction 1-500,000.
22			37.7	37.9	
23			37.6	37.8	
May 12			37.6	37.7	
13	6 tubes		37.7	38.3	Living bacilli.
14			38.8	39.0	Appetite poor.
15			37.5	37.5	
16			37.6	37.8	Appetite returned.
17			38.0	37.7	Small abscess; soon healed on opening.
18			37.7	37.7	
19			37.6	37.6	
20			37.6	37.6	
July 14			37.8	38.0	
15			37.6	37.8	
16			37.9	38.1	
17			38.0	38.0	
18			37.9	37.9	
19			37.8	38.0	
20			37.9	38.0	
21			37.8	37.7	
22			37.8	37.9	
23			37.8	37.9	
24			37.8	37.9	
25	10 tubes		37.8	39.8	J. H. Hospital typhoid.
26			39.4	38.5	Appetite not very good.
27			37.8	37.8	
28			38.0	37.9	
29			37.9	38.0	
30			37.9	38.1	
31			37.7	37.9	
Aug. 1			37.8	37.8	
2			37.6	37.8	
3			37.6	37.8	
4			37.8	37.8	
5			37.7	37.9	
6			37.9	38.0	
7			37.8	38.0	
8			37.6	37.8	
9			37.6	37.7	
Sept. 24			37.6	37.8	
25			37.8	37.7	
26	11 tubes		37.8	37.8	

Date.	Quantity of toxin.	Strength of toxin.	Temperature.		Remarks,
			A. M.	P. M.	
1899.					
Sept 27	-----	-----	38.2	38.4	Appetite poor.
28	-----	-----	37.5	37.8	
29	-----	-----	37.4	37.5	Appetite good.
30	-----	-----	37.5	37.7	
Oct. 1	-----	-----	37.6	37.6	
2	-----	-----	37.6	37.6	
3	-----	-----	37.5	37.6	
4	-----	-----	37.6	37.5	
5	-----	-----	37.6	37.6	
6	-----	-----	38.0	37.7	
7	-----	-----	37.6	37.7	
8	-----	-----	37.7	37.7	
9	-----	-----	37.9	37.8	
10	-----	-----	37.7	37.7	
11	-----	-----	37.8	37.8	
12	-----	-----	37.9	37.7	
13	-----	-----	37.9	37.9	
14	-----	-----	37.9	37.8	
15	-----	-----	37.8	37.9	
16	-----	-----	37.9	37.7	
17	-----	-----	38.1	37.8	
18	-----	-----	37.9	37.9	
19	-----	-----	37.9	37.9	
20	-----	-----	37.8	37.7	
21	-----	-----	37.7	37.7	
22	-----	-----	37.5	37.6	
23	-----	-----	37.5	37.6	
24	-----	-----	37.5	37.7	
25	-----	-----	37.5	37.5	
26	-----	-----	37.4	37.6	
27	-----	-----	37.6	37.8	
28	-----	-----	37.5	37.6	
29	-----	-----	37.6	37.6	
30	-----	-----	37.4	37.6	
31	-----	-----	38.1	38.0	
Nov. 1	-----	-----	37.9	37.9	
2	-----	-----	37.8	37.7	
3	-----	-----	37.8	38.0	
4	-----	-----	37.8	37.7	
5	-----	-----	37.4	37.6	
6	-----	-----	37.4	37.6	
7	-----	-----	37.7	37.7	
8	-----	-----	37.6	37.7	
9	-----	-----	37.7	37.7	
10	-----	-----	37.8	37.7	
11	-----	-----	37.8	37.8	
12	-----	-----	37.6	37.7	
13	-----	-----	37.7	37.7	
14	-----	-----	37.6	37.5	
15	-----	-----	37.7	37.7	
16	-----	-----	37.7	37.6	
17	-----	-----	37.6	37.6	
18	-----	-----	37.7	37.7	
19	-----	-----	37.7	37.8	
20	-----	-----	37.9	37.7	
21	-----	-----	37.7	37.6	
22	-----	-----	37.7	37.7	
23	-----	-----	37.7	37.7	
24	-----	-----	37.8	37.7	
25	-----	-----	37.5	37.6	
26	-----	-----	37.5	37.6	
27	-----	-----	37.6	37.7	

NEW HYGIENIC LABORATORY BUILDING.

I have to renew my recommendation which has heretofore been made that the laboratory be taken from the Marine-Hospital Bureau building and that a suitable building be provided for it by act of Congress. The work of the laboratory has so increased that its present quarters are too cramped and it is obvious, moreover, that the character of work performed in the laboratory requires a special detached building.

I will add here that the work of the laboratory during the last fiscal year was unavoidably interrupted by the necessity of detailing its principal officers for temporary duty in connection with Service measures to prevent infection being introduced with the returning troops from Cuba. On account of their special knowledge and experience, the two principal officers of the laboratory were detailed for a short period of time at Montauk Point. Passed Assistant Surgeon Kinyoun was relieved from duty in April as director of the laboratory, and Passed Assistant Surgeon Sprague was made acting director, and the latter was succeeded shortly by Passed Assistant Surgeon Rosenau as director.

SCIENTIFIC INVESTIGATION OF THE CAUSE OF YELLOW FEVER.

The commission appointed by direction of the President to investigate the cause of yellow fever, reference to which was made in the annual reports for 1897 and 1898, concluded their work and presented their report under date of July 10, 1899, the report confirming the discovery by Professor Sanarelli of the bacillus *icteroides*. This report has been published both in the public health reports and in separate pamphlet form, and on this account it is not reproduced here. Following their findings the immunization of a horse with a view to obtaining a serum that would prove efficacious in the prevention and cure of yellow fever was begun, and this work will be continued throughout the coming year.

THE ELIMINATION OF YELLOW FEVER.

The subject of the elimination of yellow fever through an international agreement for the sanitation of such seaports as are known as the habitual breeding places of this disease has already been referred to in an article by myself published in the Forum for February, 1899, and to be found in this report in the chapter of contributed articles under the heading "Quarantine and Sanitation."

The foci of yellow fever are distributed in so many countries in the Western Hemisphere that the cleaning of one port and the elimination of the disease therefrom would still leave it subject to renewed invasion from other ports not thus made sanitary, so that in the interest of all it appears to be necessary that, by a mutual agreement between the republics of the Western Hemisphere, such sanitation as is necessary to prevent the constant recurrence of this disease should be enforced. Not only is this necessary to save human life, but also to prevent the restrictions upon commerce which are caused by this disease. Public sentiment should be aroused to sustain these sanitary measures, and there should be an international sentiment which would uphold any nation of the Western Hemisphere free of this disease in deeming it an unfriendly attitude on the part of any other nation

which fails to root out this general enemy from its seaports. What may be done has already been and is still being illustrated by the successful efforts of the Government authorities in Cuba in diminishing the prevalence of this disease by proper sanitary measures in the several parts of the island. A general agreement among the republics of the Western Hemisphere which would bring about the sanitation of seaports and the elimination of yellow fever would also have a marked effect upon general municipal sanitation everywhere, and its influence in thus advancing the general health and prosperity would be almost incalculable.

CONCLUSION.

A review of the work of the year as outlined in the foregoing pages will show the wide scope of the Service operations and the numerous and varied duties performed in behalf of the Government. An enumeration, however brief, of these duties would require a list so long as to be tiresome in reading, and, moreover, they are set forth in outline in the complete table of contents.

It may be said that the period covered by this report is signalized by an amount and variety of labor and responsibility thrown upon the Marine-Hospital Service in great excess of any corresponding period in its history.

Including the regular corps, about 650 physicians, 38 hospital stewards, and 2,312 employees were engaged. At the close of the season these numbers were reduced to 240 physicians, 38 hospital stewards, and 543 employees. The number of persons under the official surveillance of the Service was more than 600,000 at the various hospitals, immigration and quarantine stations, detention camps, etc.

Critical situations have had to be met, requiring great activity both in the Bureau and in the field. The personal service required of a number of officers has involved and received a devotion to duty unsurpassed. Three of the officers contracted yellow fever while engaged in its suppression, and the death of one of these, Dr. McAdam, an officer of great promise, serves to but emphasize the serious nature of his calling. Several officers, on account of their special adaptability, it was found necessary to move from one danger post to another in quick succession, and some were taken from their desks in the Bureau to meet exigencies arising in the field. The departure of these latter increased the difficulties and labors of the Bureau itself, temporarily interrupting the established system of headquarters management. The reorganization of the Bureau, however, as described in the foregoing pages, it is confidently believed will have a marked and beneficial effect in the conduct of the Service hereafter.

As illustrating the varied services performed during the year, in addition to the regular work in the hospitals and at the quarantine stations, mention should be made of the participation of one officer,

the surgeon of the revenue steamer *McCulloch*, in the battle of Manila Bay, the service of another on the staffs of two governors of States, and the signal service performed by Sanitary Inspector W. F. Brunner at Habana, just prior to the declaration of war, in securing and forwarding to the War Department complete plans and specifications of the military defenses of Habana—information which was used by the General of the Army, as I am informed unofficially, in the preparation of plans of attack, and which was obtained by Dr. Brunner at personal expense and great personal risk.

A review of the operations of the Service with regard to epidemic diseases can but inspire an increased confidence in the efficacy of the measures necessary to prevent their spread. In the matter of yellow fever it has been demonstrated that besides the detention camp and cordon the train-inspection service, as conducted by the Marine-Hospital Service, is quite effective in preventing the spread of the disease from one locality to another. It is hoped, however, that the measures suggested in the foregoing pages looking ultimately to the absolute conquering of this disease may be adopted in the near future.

Toward the close of the quarantine season of 1898, I visited certain sections of the South with a view to witnessing the operations of the Service. It was my fortune to visit one city while the fever was still prevailing and where in consequence business appeared to be entirely suspended and desolation seemed to be its most striking feature. It was an object lesson of the ruin worked by the yellow scourge such as should stimulate all citizens, as well as national governments, to every exertion for the utter elimination of this disease. The suggestions embraced in the portions of the foregoing report relating to this matter have received, when verbally made, only cordial indorsement, and it is proposed to continue a study and discussion of this matter until some practical plan may be consummated.

I have the honor to remain, respectfully,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

INDEX.

A.		Page.
Act of Congress providing for the investigation of leprosy in the United States		440
Additions and amendments to the Marine-Hospital Service regulations for the management of the purveying depot		82, 83
Adee, Hon. Alvey A., Second Assistant Secretary of State, circular to consular officers of the United States		389
Administrative details		70-83
Circular letter—		
Relative to treatment of tuberculous patients in separate wards and replies thereto		70, 71
Instructions relative to diagnosis of smallpox		71
Relative to vaccination of crews of vessels		72
Relative to marking furniture		72
Relative to use of bedside table		72
Relative to copies of correspondence		73
Relative to relief of sick, disabled, or destitute seamen in Cuban ports		73
Amendment to Marine-Hospital Service regulations		74
Letter of Hon. Thomas W. Cridler, Third Assistant Secretary of State, to the Secretary of the Treasury, relative to relief of sick, disabled, or destitute seamen in Cuban ports		74
Correspondence relative to forged master's certificate		75
Rules governing the physical examination of Naval Academy graduates seeking position in the Revenue-Cutter Service		75
Aid to other branches of the Government service		38, 39
Immigration service		39
Army and Navy		39
Coast and Geodetic Survey		39
Life-Saving Service		39
Light-House Service		39
Naval Reserves		39
Revenue-Cutter Service		39
Steamboat-Inspection Service		39
Alexandria, Egypt, investigation of disinfection of rags at		571, 572
Alexandria, Va., smallpox in		761, 763
Report on smallpox in (Sanitary Inspector Snowden)		762, 763
Amendments and additions to quarantine regulations		830, 832
American Medical Association, report on, Surg. P. H. Bailhache		19-21
Antwerp, report of method of inspection of emigrants at (Surgeon Warden)		584
Appointments and promotions		17
Army and Navy, aid to		39
B.		
Bailhache, P. H., Surg.:		
Detailed to represent the service at the fiftieth annual meeting of the American Medical Association, held in Columbus, Ohio, June 6-9, 1899		19
Report on fiftieth annual meeting of the American Medical Association		19-21
Letter relative to shelter for crews on river steamers		42
Baltimore Marine Hospital (report of Surg. Geo. Purviance)		46
6488—01—55		865

	Page.
Banks, C. E., Surg.:	
Delegate to the National Pure Food and Drug Congress, held in Wash- ington, January 18-21, 1899, report of	21, 22
Letters relative to removal of purveying division to New York	77-81
Sketch of the English prototype and the development of a hospital service in the United States	266-274
Article by, "A new service ambulance"	275-278
Belize, British Honduras, report of quarantine transactions at (Acting Assistant Surgeon Knight)	548
Bibliography of leprosy	441
Bills of health, consular, regulations concerning	832, 833
Bluefields, Nicaragua, report of quarantine transactions at (Acting Assist- ant Surgeon Goodman)	547
Boards of examination	17
Bocas del Toro, Colombia, report of quarantine transactions at (Acting Assistant Surgeon Mohr)	538, 540
Boston marine hospital (report of Surg. Fairfax Irwin)	47
Bremen, report of method of inspection of emigrants at (Surgeon Wasdin)	583
Brown, B. W., P. A. Surg., report on Cape Fear quarantine station	798, 799
British Columbia, quarantine at Williams Head, report on (Assistant Surgeon Foster)	829
British Honduras, report of quarantine transactions at Belize (Acting Assistant Surgeon Knight)	548
Brunswick quarantine station, report on (Sanitary Inspector Burford) ...	810, 812
Bureau, organization of	13-16
Burford, R. E. L., sanitary inspector, report on Brunswick quarantine station	810, 812
C.	
Cairo marine hospital (report of Asst. Surg. H. C. Russell)	48
California, smallpox among soldiers in San Francisco	768, 769
Cape Charles quarantine station, report on (Surgeon Pettus)	797, 798
Cape Fear quarantine station, report on (Passed Assistant Surgeon Brown)	798, 799
Care of seamen, contracts for	57-64
Carmichael, D. H., Surg., report of quarantine transactions at Honolulu, H. I.	550, 551
Carrington, P. M., Surg., report of disinfection of soldiers' baggage at Egmont Key, Fla., detention camp	638, 639
Carson, William H., Actg. Asst. Surg., report of quarantine transactions at Port Limon, Costa Rica	537, 538
Carter, H. W., Surg.:	
Detailed for duty in Cuba	469
Report on post-epidemic disinfection	607-613
Letter relative to post-epidemic disinfection	613
Report on post-epidemic aeration and disinfection	615, 616
Report on yellow fever in Port Tampa City, Fla.	744, 747
Report on yellow fever in New Orleans and Jackson, La.	685
Report on yellow fever in Louisiana and Mississippi	685-694
Casualties	17
Ceiba, Honduras, report of quarantine transactions at (Acting Assistant Surgeon Hamilton)	541-545
Central America, inspection of vessels at fruit ports of	520-548
Cerebro-spinal meningitis, investigation of	409-418
Chicago marine hospital (report of Surg. H. W. Sawtelle)	49
China:	
Correspondence relative to plague in Hongkong	566, 567
Report of quarantine transactions at Hongkong (Passed Assistant Sur- geon Perry)	567, 570
Cholera	390
Circular:	
(Supervising Insp. Gen. James A. Dumont) providing for sleeping room for crews plying the Mississippi River and its tributaries ...	40, 41
Contracts for care of seamen	57-64
Amending Marine-Hospital Service regulations	74
Adding to and amending Marine-Hospital Service regulations for the management of the purveying depot	82, 83

Circular—Continued.	Page.
(Second Assistant Secretary of State A. A. Adeë) directing consular officers to forward weekly sanitary reports	389
Regulations concerning consular bills of health	832, 833
Circular letter, announcing death of Asst. Surg. William R. McAdam ..	17, 18
Relative to treatment of tuberculous patients in separate wards, and replies thereto	70, 71
Instructions relative to diagnosis of smallpox	71
Relative to vaccination of crews of vessels	72
Relative to marking furniture	72
Relative to use of bedside tables	72
Relative to copies of correspondence	73
Relative to relief of sick, disabled, or destitute seamen in Cuban ports ..	73
Relative to cerebro-spinal meningitis	409
Cienfuegos, Cuba:	
Report of quarantine transactions at (Assistant Surgeon Grubbs) ..	505-509
List of vessels in quarantine service employed at	512
Cincinnati Marine Hospital (report of Actg. Asst. Surg. J. W. Stevenson) ..	49
Clark, T., Asst. Surg.:	
Report on detention of troops at South Atlantic quarantine stations ..	635-636
Report on Tortugas quarantine station	812-816
Cleveland Marine Hospital (report of P. A. Surg. H. W. Wickes)	49
Coast and Geodetic Survey, aid to	39
Cobb, J. O., P. A. Surg., report of quarantine of troops at Savannah, Ga. ..	626, 627
Cofer, L. E., Asst. Surg.:	
Detailed for duty in Mexico	524
Report on measures to prevent introduction of yellow fever from Mexico ..	525-530
Colombia, report of quarantine transactions at Bocas del Toro (Acting Assistant Surgeon Mohr)	538, 540
Columbia River quarantine station, report on (Assistant Surgeon Hastings) ..	825, 827
Congress, act of, providing for the investigation of leprosy in the United States	440
Congress for combating tuberculosis held in Berlin, Germany, May 24-27, 1899, report on (P. A. Surg. George T. Vaughan) ..	28-38
Consular bills of health:	
Correspondence relative to irregularities in	585
Regulations concerning	832, 833
Contracts for care of seamen	57-64
Contributed articles:	
Quarantine and commerce (by Surgeon-General Wyman)	226-240
Quarantine and sanitation (by Surgeon-General Wyman)	241-248
Historical sketch of the service at Chicago, Ill. (by Surg. H. W. Sawtelle) ..	249-253
Treatment of sick and wounded soldiers from Cuban battlefields (by Surg. George W. Stoner) ..	254-265
Sketch of the English prototype and the development of a hospital service in the United States (by Surg. C. E. Banks)	266-274
A new service ambulance (by Surg. C. E. Banks)	275-278
Lumbar puncture in treatment of cerebro-spinal fever (by P. A. Surg. T. B. Perry) ..	279-286
Climatic treatment of tuberculosis, Fort Stanton sanatory ranch ..	287-290
Notes on surgical clinics in Berlin, Paris, and London (by P. A. Surg. G. T. Vaughan) ..	291-298
History of a case of arsenical poisoning (by P. A. Surg. W. J. S. Stewart) ..	299-304
Gunshot wound of the face (by P. A. Surg. J. H. Oakley)	305
Report of the cruise of the U. S. S. McCullough (by P. A. Surg. Joseph B. Greene) ..	306-312
Convention of health officers held in New Orleans, La., February 9, 1899, report on (Surg. J. H. White)	26-28
Corput, G. M., Asst. Surg., report on detention of troops at Egmont Key, Fla., detention camp	639-643
Correspondence relative to—	
Shelter for crews on steamboats on the Ohio River	41, 44
Establishment of a sanatorium for tuberculous patients at Fort Stanton, N. Mex.	65-69

Correspondence relative to—	Page.
Forged master's certificate.....	75
Removal of Purveying Division to New York.....	77-81
Plague in Hongkong, China.....	566, 567
Quarantine and immigration inspection at Naples, Italy.....	572, 577
Irregular consular bills of health.....	585
Transfer of medical transport service to War Department.....	586, 588
Costa Rica, report of quarantine transactions at Port Limon (Acting As- sistant Surgeon Carson).....	537, 538
Cridler, Hon. Thomas W., Third Assistant Secretary of State:	
Letter to Secretary of Treasury relative to relief of sick, disabled, or destitute seamen in Cuban ports.....	74
Letter directing consular officers to forward reports of leprosy.....	420
Letter to Secretary of Treasury relative to yellow fever in Vera Cruz, Mexico.....	523
Cuba and Porto Rico:	
Executive orders relative to quarantine administration in (William McKinley).....	468, 469
Quarantine administration in.....	468-521
Cuba:	
Letter to Secretary of War relative to quarantine administration in (Hon. L. J. Gage).....	471
Report of inspection of quarantines (Passed Assistant Surgeon Rose- nan).....	473
Quarantine organization completed.....	474
Report of quarantine transactions at—	
Habana (Assistant Surgeon Dudley).....	475-483
Matanzas (Passed Assistant Surgeon Guiteras).....	483-488
Nuevitas (Assistant Surgeon Richardson).....	488-489
Santiago (Assistant Surgeon Parker).....	490-505
Table of mortality statistics of Santiago.....	499-502
Report of quarantine transactions at Cienfuegos and subports (Assist- ant Surgeon Grubbs).....	505-509
List of vessels in quarantine service employed in.....	510-512
Medical inspection of immigrants in.....	605, 606
Quarantine safeguards in connection with troops returning from.....	620, 643
Cumming, H. S., P. A. Surg., report on South Atlantic Quarantine Station.....	807, 810

D.

Dumont, James A., Supervising Inspector-General of Steam Vessels:	
Circular providing sleeping room for crews plying the Mississippi River and its tributaries.....	40, 41
Letters relative to shelter for crews on river steamers.....	42, 43
Daufuskie Island, S. C., report on detention of troops on (Assistant Sur- geon von Ezdorf).....	630-635
Delaware Breakwater Quarantine Station, report on (Passed Assistant Sur- geon Young).....	794-797
Detroit Marine Hospital (report of Surg. John Godfrey).....	50
Disinfecting steamer <i>Sanitor</i> , description of (First Assistant Engineer Green, Revenue-Cutter Service).....	834-845
District of Columbia, yellow fever in.....	391
Dorsey, E. L., Supervising Inspector, Steamboat-Inspection Service, letter relative to shelter for crews on river steamers.....	43, 44
Dudley, D. E., A. A. Surg., report of quarantine transactions at Habana.....	475-483

E.

Egmont Key, Fla., detention camp:	
Report of disinfection of soldiers' baggage at (Surgeon Carrington).....	638, 639
Report on detention of troops at (Assistant Surgeon Carpent).....	639-643
Egypt, investigation of disinfection of rags at Alexandria and other ports.....	571, 572
Eldridge, Stuart, A. A. Surg., report of quarantine transactions at Yoko- hama, Japan.....	557-565
Emigrants, report of methods of inspection of, at Bremen, Hamburg, Antwerp, and Rotterdam (Surgeon Wasdin).....	582, 585
Epidemic dysentery in Japan.....	418
Tabulated statement.....	419

	Page.
Establishment of a sanatorium for tuberculous patients at Fort Stanton, N. Mex	65-69
Evansville Marine Hospital (report of P. A. Surg. J. H. Oakley)	51

F.

Farquhar, R. R., A. A. Surg., report on yellow fever in Soldiers' Home near Hampton, Va	681, 682
Financial statement	87-90
Florida:	
Yellow fever in	391
in Key West	694-718
in Miami	718-743
Report on yellow fever in Key West (Assistant Surgeon McAdams)	705-706
Report on yellow fever in Miami (Passed Assistant Surgeon Stimpson)	723,
724, 727, 729, 731-733, 733-734, 735-737	737-738
Report on yellow fever in Miami (Assistant Surgeon von Ezdorf)	724, 726
Report (clinical) of a case of yellow fever in Miami (Assistant Surgeon von Ezdorf)	729, 731, 734, 735
Yellow fever in Port Tampa city	743-748
Report on yellow fever in Port Tampa city (Surgeon Carter)	744, 747
Coast patrol	748-755
Forged masters' certificates, correspondence relative to	75
Fort Stanton, N. Mex., establishment of a sanatorium for tuberculous patients	65-69
Foster, M. H., Asst. Surg., report on—	
Port Townsend quarantine station	929
British Columbia quarantine at Williams Head	829
Fricks, L. D., Asst. Surg., report on army transport service	595, 596

G.

Gage, Hon. L. J., Secretary, letter to—	
Secretary of Interior, relative to the establishment of a sanatorium for tuberculous patients at Fort Stanton, N. Mex	68
Secretary of Interior, requesting that the Fort Stanton Military Reservation be turned over to the Marine-Hospital Service	69
Secretary of State, relative to relief of sick, disabled, or destitute seamen in Cuban ports	73
Secretary of War, relative to quarantine administration in Cuba	471
Secretary of State, relative to yellow fever in Vera Cruz, Mexico	523
Secretary of War, relative to inspection at Hongkong and Yokohama of army transports from the Philippines	555
Gardner, C. H., P. A. Surg., report on marine hospital at Port Townsend, Wash.	54
Gassaway, J. M., Surg., report on marine hospital at San Francisco, Cal.	54
Georgia, smallpox in	763, 768
Glennan, A. H., Surg.:	
Detailed as quarantine officer at San Juan, P. R.	512
Report of quarantine transaction at San Juan, P. R.	513-519
Godfrey, John, Surg., report on marine hospital at Detroit, Mich	50
Goodman, D. W., Actg. Asst. Surg., report on quarantine transactions at Bluefields, Nicaragua	546
Green, C. M., first assistant engineer, Revenue-Cutter Service, description of the disinfecting steamer <i>Sanitar</i>	834, 845
Greene, Joseph B., P. A. Surg., report of the cruise of the U. S. S. <i>McCulloch</i>	306-312
Grubbs, S. B., Asst. Surg., report of quarantine transactions at Cienfuegos and supports	502-509
Guatemala, report of quarantine transactions at Livingston (Acting Assistant Surgeon Vance)	545-547
Guiteras, G. M., P. A. Surg., report of quarantine transactions at Matanzas and supports	475-483
Gulf quarantine station, report on (Surgeon Kalloch)	816, 817

H.	
Habana, Cuba:	Page.
Report of quarantine transactions at (Acting Assistant Surgeon Dudley)	475-483
List of vessels in quarantine service employed at	511
Hamburg, report of method of inspection of emigrants at (Surgeon Wasdin)	583
Hamilton, William T., Actg. Asst. Surg., report of quarantine transactions at Ceibu, Honduras	541-545
Hampton, Va.:	
Yellow fever in Soldiers' Home	390
Yellow fever in the National Soldiers' Home at	648, 682
Preliminary report on yellow fever in Soldiers' Home (Surgeon Wasdin)	660, 661
Final report on yellow fever in Soldiers' Home (Surgeon Wasdin)	661, 663
(Surgeon White)	663, 668
(Passed Assistant Surgeon Wertenbaker)	668, 669
(Assistant Surgeon von Ezdorf)	670, 679
(Acting Assistant Surgeon Farquhar)	681, 682
List of cases of, and deaths from yellow fever in Soldiers' Home	673, 674
Hastings, H., Asst. Surg., report on Columbia River quarantine station ..	825, 827
Hawaii:	
Report of quarantine transactions at Honolulu (Surgeon Carmichael) ..	550, 551
List of vessels inspected at Honolulu	552, 553
Heiser, V. G., Asst. Surg., report of quarantine transactions at Naples, Italy	577, 578
Hitchcock, Hon. E. A., Secretary of the Interior:	
Letter to Secretary of the Treasury relative to the establishment of a sanatorium for tuberculous patients at Fort Stanton, N. Mex	68, 69
Letter to Secretary of the Treasury relinquishing control of the Fort Stanton abandoned military reservation to the Marine-Hospital Service	69
Hodgson, S. H., appointed acting assistant surgeon for duty in Mexico ..	521, 522
Honduras, report of quarantine transactions at—	
Puerta Cortez (Acting Assistant Surgeon Wailles)	534-537
Ceibo (Acting Assistant Surgeon Hamilton)	541-545
Hongkong, China:	
Correspondence relative to plague in	566, 567
Report of quarantine transactions at (Past Assistant Surgeon Perry) ..	567, 570
Honolulu, Hawaii:	
Report of quarantine transactions at (Surgeon Carmichael)	550, 551
List of vessels inspected at	552, 553
Hough J. S., Actg. Asst. Surg., report on army transport service	600-602
Hygienic laboratory, report on (Acting Director Sprague)	846, 861
I.	
Immigration Service, aid to	39
Immigration, and insular and foreign quarantine, division of	468-605
Immigrants in Cuba and Porto Rico, medical inspection of	605, 606
Inspection of marine hospital stations	46
Inspection, medical, of immigrants in Cuba and Porto Rico	605-606
Inspection of the Texas-Mexican border	748
International conference for the prevention of venereal disease held at Brussels, September, 1899, report, with inclosure, on (Surg. Eugene Wasdin)	22-24
Irwin, Fairfax, Surg.:	
Report on marine hospital at Boston, Mass	47
Letter relative to forged master certificates	75
Report on plague in Oporto and conditions in Marseille and Barcelona ..	579, 580
Italy:	
Correspondence relative to quarantine and immigration inspection at Naples	572, 577
Report of quarantine transactions at Naples (Assistant Surgeon Heiser)	577, 578

J.

	Page.
Jackson and New Orleans, La., report on yellow fever in (Surgeon Carter)	685
Japan:	
Epidemic dysentery in	418
Tabulated statement	419
Report of quarantine transactions at Yokohama (Acting Assistant Surgeon Eldridge)	567, 565

K.

Kalloch, P. C., Surg., report on Gulf quarantine station	816, 817
Key West, Fla.:	
Marine Hospital (report of Surg. R. D. Murray)	51
Yellow fever in	694-718
Report on yellow fever in (Assistant Surgeon McAdam)	705-706
Kinyoun, J. J., P. A. Surg.:	
Delegate to the National Pure Food and Drug Congress held in Washington January 18-21, 1899, report of	19, 22
Report on San Francisco quarantine station	819, 823
Knight, C. W., Actg. Asst. Surg., report of quarantine transactions at Belize, British Honduras	548

L.

Laboratory, hygienic, report on (Acting Director Sprague)	846, 861
Lavinder, C. H., Asst. Surg.:	
Detailed as quarantine officer at Ponce, P. R.	513
Report of quarantine transactions at Ponce, P. R.	520, 521
Leprosy	419-443
In Bahia, Brazil	420
In Pernambuco, Brazil	421
In Rio de Janeiro, Brazil	422
In Colombia	423
In Barranquilla, Colombia	427
In the district of Colon, Colombia	428
In Ecuador	428
In British, Dutch, and French Guiana	430
In Paraguay	432
In Venezuela	433
In Maracaibo, Venezuela	435
In the United States, investigation of	440
Tabulated statement of cases	440
Bibliography of	441
Life-Saving Service, aid to	39
Light-House Service, aid to	39
Linley, W. J., Actg. Asst. Surg., report on Savannah quarantine station	799, 801
Livingston, Guatemala, report of quarantine transactions at (Acting Assistant Surgeon Vance)	545-547
Louisville Marine Hospital (report of P. A. Surg. W. P. McIntosh)	51
Louisiana:	
Yellow fever in	391
Report on yellow fever in New Orleans and Jackson (Surgeon Carter)	685
Louisiana and Mississippi:	
Yellow fever in	682, 694
Report on yellow fever in (Surgeon Carter)	685-694
Lunsden, L. L., Asst. Surg., report on army transport service	590, 595

M.

McAdam, William R., Asst. Surg.:	
Death of	17
Report on detention of troops at Tortugas quarantine station	636, 637
Yellow fever in Key West, Fla.	705, 706
McAdam detention camp, report on (Passed Assistant Surgeon Stimpson)	740, 743
McConnell, E. F., Actg. Asst. Surg., report on army transport service	602-605
McIntosh, W. P., P. A. Surg.:	
Letters relative to shelter for crews on steamboats on the Ohio River	41, 42
Report on marine hospital at Louisville, Ky	51
McKay, W. W., Actg. Asst. Surg., reports on San Diego quarantine station	817, 818

	Page,
McKinley, William, executive order:	
Reserving and setting apart the Fort Stanton abandoned military reservation for use of the Marine-Hospital Service	69
Relative to quarantine administration in Cuba and Porto Rico	468, 469
McMullen, John, Asst. Surg., report on—	
Marine hospital at Portland, Me.....	53
Army transport service	596, 598
Magruder, G. M., P. A. Surg., report on—	
Marine hospital at Memphis, Tenn	52
Quarantine of troops at Montauk Point, N. Y	622, 625
Manila, inspection at Hongkong and Yokohama of army transports from	555, 557
Marine hospital for New York	56
Marine hospitals, reports of repairs of	46-56
Baltimore, Md	46
Boston, Mass	47
Cairo, Ill	49
Chicago, Ill	49
Cincinnati, Ohio	49
Cleveland, Ohio	49
Detroit, Mich	50
Evansville, Ind	51
Key West, Fla.	51
Louisville, Ky	51
Memphis, Tenn	52
Mobile, Ala	52
New Orleans, La	53
Portland, Me	53
Port Townsend, Wash	54
San Francisco, Cal	54
St. Louis, Mo	55
Vineyard Haven, Mass	56
Wilmington, N. C	56
Marine hospitals and relief furnished	46
Marine-Hospital Service:	
Regulations, amendment to	74
Additions and amendments to, for the management of the purveying depot	82, 83
Transfer of Savannah quarantine station to	801-806
Marine hospital stations, inspection of	46
Matanzas, Cuba:	
Report of quarantine transactions at (Passed Assistant Surgeon Guiteras)	483-488
List of vessels in quarantine service employed at	512
Mead, F. W., surgeon, report on marine hospital at Vineyard Haven, Mass	56
Measures for the relief of the families of deceased officers	18
Medical Corps	17
Boards of examination	17
Promotions and appointments	17
Resignations	17
Casualties	17
Medical inspection of immigrants in Cuba and Porto Rico	605, 606
Memphis marine hospital (report of P. A. Surg. G. M. Magruder)	52
Mexico:	
Letter to Secretary of State relative to yellow fever in Vera Cruz (Hon. L. J. Gage)	523
Secretary of Treasury relative to yellow fever in Vera Cruz (Hon. Thos. W. Cridler)	523
Assistant Surgeon Cofer detailed for duty in	524
Quarantine inspection, service in	521-530
Report on measures to prevent introduction of yellow fever from (Assistant Surgeon Cofer)	525-530
Miami, Fla.:	
Yellow fever in	718-743
Report on yellow fever in (Passed Assistant Surgeon Stimpson)	723,
724, 727, 729, 731-733, 733-734, 735-737, 737-738	
(Assistant Surgeon von Ezdorf)	724, 726
Report (clinical) of a case of yellow fever in (Assistant Surgeon von Ezdorf)	729, 731, 734, 735
Mississippi, yellow fever in	391

	Page.
Mississippi and Louisiana:	
Yellow fever in	682-694
Report on yellow fever in (Surgeon Carter)	685-694
Mobile Marine Hospital (report of Surg. R. D. Murray)	52
Mohr, H. B., acting assistant surgeon, report of quarantine transactions at Bocas del Toro, Colombia	538, 540
Montauk Point, N. Y., report of quarantine of troops at (Passed Assistant Surgeon Magruder)	622, 625
Mortality statistics:	
Table of, Santiago de Cuba	499-502
In cities and towns of the United States	443-467
Murray, R. D., surgeon, report on marine hospital—	
At Key West, Fla	51
At Mobile, Ala	52

N.

National Pure Food and Drug Congress, report of Surg. C. E. Banks and P. A. Surg. J. J. Kinyoun, delegates to	21, 22
National Soldiers' Home, near Hampton, Va.:	
Yellow fever in	648, 682
Preliminary report on yellow fever in (Surgeon Wasdin)	660, 661
Final report on yellow fever in (Surgeon Wasdin)	661, 663
Reports on yellow fever in (Surgeon White)	663, 668
(Passed Assistant Surgeon Wertenbaker)	668, 669
(Assistant Surgeon von Ezdorf)	670, 679
List of cases of and deaths from yellow fever	673-674
Report on yellow fever in (Acting Assistant Surgeon Farquhar)	681, 682
Report on yellow fever in (Surgeon Pettus)	680, 681
Naples, Italy:	
Correspondence relative to quarantine and immigration inspection at	572, 577
Report of quarantine transactions at (Assistant Surgeon Heiser)	577, 578
Naval reserves, aid to	39
Navy and Army, aid to	39
Navy, rules governing the physical examination of Naval Academy grad- uates seeking position in the Revenue-Cutter Service	75
Necropsies and reports of fatal cases	93-221
New Mexico, Fort Stanton, establishment of a sanatorium for tuberculous patients	65-69
New Orleans Marine Hospital (report of P. A. Surg. J. A. Nydegger)	53
New Orleans and Jackson, La., report on yellow fever in (Surgeon Carter)	685
New York:	
Marine hospital for	56
Yellow fever in	392
Nicaragua, report of quarantine transactions at Bluefield (Acting Assis- tant Surgeon Goodman)	547
Nuevitis, Cuba:	
Report of quarantine transactions at (Assistant Surgeon Richardson)	488, 489
List of vessels in quarantine service employed at	512
Nydegger, J. A., P. A. Surg., report on marine hospital at New Orleans, La	53

O.

Oakley, J. H., P. A. Surg.:	
Report on marine hospital at Evansville, Ind	51
Article by, "Gunshot wound of the face"	305
Officers detailed to represent the Service at meetings of medical and public health associations (Surg. Charles E. Banks, P. A. Surg. J. J. Kinyoun, Surg. J. H. White, P. A. Surg. G. T. Vaughan, Surg. P. H. Bailhache)	19
Ohio, yellow fever in	392
Oporto, Portugal, report on plague in (Surgeon Irwin)	579, 580
Organization of the Bureau	13-16

P.

Parker, H. B., Asst. Surg.:	
Report of quarantine transactions at Santiago and subports	490-505
Report on army transport service	598-600

Patients:	Page.
Number treated	46
in hospital	46
in dispensary	46
Tuberculous, establishment of a sanatorium for, at Fort Stanton, N.	
Mex	65-69
Treatment of, in separate wards	70
Perry, J. C., P. A. Surg.:	
Report of quarantine transactions at Hongkong, China	567, 570
Report on Port Townsend quarantine station	828
Perry, T. B., P. A. Surg., article on lumbar puncture in treatment of cerebro-spinal fever	279-286
Pettus, W. J., Surg., report on—	
Yellow fever in Soldiers Home near Hampton, Va	680, 681
Cape Charles quarantine station	797, 798
Philippine Islands:	
Correspondence relative to quarantine administration in	553, 555
Inspection at Hongkong and Yokohama of army transports from	
Manila	555, 557
Plague in—	
Arabia, China, India, and Japan	395
And other countries, tabular statement	396
Hongkong, China, correspondence relative to	566, 567
Spain and Portugal	578
Plan of organization for suppression of smallpox (Passed Assistant Surgeon Wertenbaker)	781, 793
Ponce, P. R.:	
Assistant Surgeon Lavinder detailed as quarantine officer at	513
Report of quarantine transactions at (Assistant Surgeon Lavinder) ..	520, 521
Portland Marine Hospital (report of Asst. Surg. John McMullen) ..	53
Port Limon, Costa Rica, report of quarantine transactions at (Acting Assistant Surgeon) Carson	534-537
Porto Rico and Cuba:	
Executive orders relative to quarantine administration in (William McKinley)	468-469
Quarantine administration in	468-521
Surgeon Glennan detailed as quarantine officer at San Juan	512
Assistant Surgeon Lavinder detailed as quarantine officer at Ponce ..	513
Report of quarantine transactions at San Juan (Surgeon Glennan) ..	513-519
Ponce (Assistant Surgeon Lavinder)	520, 521
Quarantine safeguards in connection with troops returning from ..	620, 643
Medical inspection of immigrants in	605, 606
Port Tampa City, Fla.:	
Yellow fever in	743, 748
Report on yellow fever in (Surgeon Carter)	744, 747
Port Townsend Marine Hospital (report of P. A. Surg. C. H. Gardner) ..	54
Port Townsend Quarantine Station, report on (Assistant Surgeon Foster) ..	827
(Past Assistant Surgeon Perry)	828
Portugal and Spain, plague in	578
Portugal, report on plague in Oporto (Surgeon Irwin)	579, 580
Post-epidemic disinfection:	
Report on (Surgeon Carter)	607-613
Letter relative to (Surgeon Carter)	613
Post-epidemic aeration and disinfection, report on (Surgeon Carter)	615, 616
Precis upon the diagnosis and prevention of smallpox	772, 781
Promotions and appointments	17
Public-health service, sanitary reports and statistics	387-467
Puerto Cortez, Honduras, report of quarantine transactions at (Acting Assistant Surgeon Wailes)	534-537
Purveying division:	
Report of	75-83
Removal of to New York	77
Purviance, George, Surg., report on marine hospital at Baltimore, Md. . .	46

Q.

	Page.
Quarantine administration, insular and foreign	468-605
Details of officers	469
Letter of instructions to Surgeon Carter, detailed for duty in Cuba (Surgeon-General Wyman)	469, 470
Letter to Secretary of War relative to (Hon. L. J. Gage)	471
Letter to Sanitary Inspector Brunner inclosing copy of War Department order relative to (Surgeon-General Wyman)	471
Letter detailing P. A. Surg. M. J. Rosenau as inspecting officer for Cuba (Surgeon-General Wyman)	472
Letter of instructions to Passed Assistant Surgeon Rosenau, inspecting officer in Cuba (Surgeon-General Wyman)	472
Report of inspection of Cuban quarantines (Passed Assistant Surgeon Rosenau)	473
Organization in Cuba completed	474
Executive orders, relative to, in Cuba and Porto Rico	468, 469
Cuba and Porto Rico	468-521
Report of transactions at Habana (Acting Assistant Surgeon Dudley)	475-483
Report of transactions at Matanzas and subports (P. A. Surg. G. M. Guiteras)	483-488
Report of transactions at Nuevitas and subports (Assistant Surgeon Richardson)	488, 489
Report of transactions at Santiago and subports (Assistant Surgeon Parker)	490-505
Table of mortality statistics of Santiago de Cuba	499-502
Report of transactions at Cienfuegos and subports (Assistant Surgeon Grubbs)	505-509
Vessels employed in Cuba, list of	510-512
Letter detailing Surgeon Glennan as quarantine officer at San Juan, P. R. (Surgeon-General Wyman)	512
Assistant Surgeon Lavinder detailed as quarantine officer at Ponce, P. R.	513
Report of transactions at San Juan, P. R. (Surgeon Glennan)	513-519
Report of transactions at Ponce, P. R. (Assistant Surgeon Lavinder)	520-521
Appointment of Dr. S. H. Hodgson as acting assistant surgeon for duty in Mexico	521
Inspection service in Mexico	521-530
Letter to Secretary of State relative to yellow fever in Vera Cruz, Mexico (Hon. L. J. Gage)	523
Letter to Secretary of Treasury relative to yellow fever in Vera Cruz, Mexico (Hon. Thomas W. Cridler)	523
Assistant Surgeon Cofer detailed for duty in Mexico	524
Report on measures to prevent introduction of yellow fever from Mexico (Assistant Surgeon Cofer)	525-530
Central American fruit-port inspection	530-548
Rules for the government of vessels at fruit ports	531
Report of transactions at Puerto Cortez, Honduras (Acting Assistant Surgeon Wailes)	534-537
Port Limon, Costa Rica (Acting Assistant Surgeon Carson)	537, 538
Bocas del Toro, Colombia (Acting Assistant Surgeon Mohr)	538, 540
Ceiba, Honduras (Acting Assistant Surgeon Hamilton)	541-545
Livingston, Guatemala (Acting Assistant Surgeon Vance)	545-547
Bluefields, Nicaragua (Acting Assistant Surgeon Goodman)	547
Belize, British Honduras (Acting Assistant Surgeon Knight)	548
Honolulu, H. I. (Surgeon Carmichael)	550, 551
List of vessels, etc., inspected at Honolulu, H. I.	552, 553
Correspondence relative to, in the Philippine Islands	553, 555
Inspection at Hongkong and Yokohama of army transports from Manila	555, 557
Report of transactions at Yokohama, Japan (Acting Assistant Surgeon Eldridge)	557-565
Correspondence relative to plague in Hongkong, China	566, 567
Report of transactions at Hongkong, China (Past Assistant Surgeon Perry)	567-570
Investigation of disinfection of rags at Alexandria and other ports in Egypt	571, 572

Quarantine administration, insular and foreign—Continued.	Page.
Correspondence relative to inspection at Naples, Italy	572, 577
Report of transactions at Naples, Italy (Acting Assistant Surgeon Heiser)	577, 578
Report on plague in Oporto and conditions in Marseille and Barcelona (Surgeon Irwin)	579, 580
Report of method of inspection of emigrants at Bremen, Hamburg, Antwerp, and Rotterdam (Surgeon Wasdin)	582-585
Correspondence relative to irregular consular bills of health	583
Correspondence relative to transfer of medical transport service to War Department	586-588
United States Army transport service, reports on	586, 605
Medical inspection of immigrants in Cuba and Porto Rico	605, 606
Quarantine administration, domestic	606-845
Report on post-epidemic disinfection (Surgeon Carter)	607-613
Letter relative to post-epidemic disinfection (Surgeon Carter)	613
Report on post-epidemic aeration and disinfection (Surgeon Carter)	615, 616
Letter relative to disinfection by aeration in New Orleans, La. (Surgeon-General Wyman)	617
Safeguards in connection with troops returning from Cuba and Porto Rico	620-643
Report of quarantine of troops at Montauk Point, N. Y. (Passed Assistant Surgeon Magruder)	622-625
Report of quarantine of troops at Savannah, Ga. (Passed Assistant Surgeon Cobb)	626, 627
Report of quarantine of troops at Savannah, Ga. (Passed Assistant Surgeon Smith)	627, 630
Report on detention of troops on Danfuskie Island, South Carolina, (Assistant Surgeon von Ezdorf)	630-635
Report on detention of troops at South Atlantic Quarantine Station (Assistant Surgeon Clark)	635, 636
Report on detention of troops at Tortugas Quarantine Station (Assistant Surgeon McAdam)	636, 637
Report of disinfection of soldiers' baggage at Egmont Key, Fla., detention camp (Surgeon Carrington)	638, 639
Report on detention of troops at Egmont Key, Fla., detention camp (Assistant Surgeon Corput)	639, 643
Yellow fever in National Soldiers' Home, Hampton, Va	648, 682
Report (preliminary) on yellow fever in Soldiers' Home near Hampton, Va. (Surgeon Wasdin)	660, 661
Report (final) on yellow fever in Soldiers' Home near Hampton, Va. (Surgeon Wasdin)	661, 663
Reports on yellow fever in Soldiers' Home near Hampton, Va. (Surgeon White)	663, 668
Report on yellow fever in Soldiers' Home near Hampton, Va. (Passed Assistant Surgeon Wertenbaker)	668, 669
Report on yellow fever in Soldiers' Home near Hampton, Va. (Assistant Surgeon von Ezdorf)	670-679
List of cases of and deaths from yellow fever in Soldiers' Home near Hampton, Va.	673, 674
Report on yellow fever in Soldiers' Home near Hampton, Va. (Surgeon Pettus)	680, 681
Report on yellow fever in Soldiers' Home near Hampton, Va. (Acting Assistant Surgeon Farquhar)	681-682
Yellow fever in Louisiana and Mississippi	682-694
Report on yellow fever in New Orleans and Jackson, La. (Surgeon Carter)	685
Report on yellow fever in Louisiana and Mississippi (Surgeon Carter)	685-694
Yellow fever in Key West, Fla.	694-718
Report on yellow fever in Key West, Fla. (Assistant Surgeon McAdam)	705, 706
Report on Tortugas detention camp (Passed Assistant Surgeon Smith)	715-718
Yellow fever in Miami, Fla	718-743
Report on yellow fever at Miami, Fla. (Passed Assistant Surgeon Stimpson)	723-724, 727-729, 731-733, 733-734, 735-737, 737-738
(Assistant Surgeon von Ezdorf)	724-726
Report (clinical) of a case of yellow fever at Miami, Fla. (Assistant Surgeon von Ezdorf)	729-731, 734, 735

Quarantine administration, domestic—Continued.	Page.
Report on Detention Camp McAdam (Passed Assistant Surgeon Stimpson)	740-743
Yellow fever at Port Tampa City, Fla	743-748
Report on yellow fever in Port Tampa City, Fla. (Surgeon Carter) ..	744-747
Inspection of the Texas-Mexican border	748
Florida coast patrol	748-755
Smallpox in the United States	755, 793
Report on Reedy Island Quarantine Station (Passed Assistant Surgeon Woodward)	793, 794
Report on Delaware Breakwater Quarantine Station (Passed Assistant Surgeon Young)	794-797
Report on Cape Charles Quarantine Station (Surgeon Pettus)	797, 798
Report on Cape Fear Quarantine Station (Passed Assistant Surgeon Brown)	798-799
Report on Savannah Quarantine Station (Acting Assistant Surgeon Linley)	799, 801
Transfer of Savannah Quarantine Station to Marine-Hospital Service ..	801-806
Report on South Atlantic Quarantine Station (Passed Assistant Surgeon Cumming)	807, 810
Report on Brunswick Quarantine Station (Sanitary Inspector Burford)	810, 812
Report on Tortugas Quarantine Station (Assistant Surgeon Clark) ..	812-816
Report on Gulf Quarantine Station (Surgeon Kalloch)	816, 817
Report on San Diego Quarantine Station (Acting Assistant Surgeon McKay)	817, 818
Report on San Francisco Quarantine Station (Surgeon Kinyoun)	819, 823
Service at San Francisco, Cal	823, 825
Report on Columbia River Quarantine Station (Assistant Surgeon Hastings)	825, 827
Report on Port Townsend Quarantine Station (Assistant Surgeon Foster)	827
Passed Assistant Surgeon Perry)	828
Report on British Columbia quarantine at Williams Head (Assistant Surgeon Foster)	829
Amendments and additions to quarantine regulations	830, 832
Regulations concerning consular bills of health	832, 833
Quarantine and commerce, address (Surgeon-General Wyman)	226-240
Quarantine and sanitation, address (Surgeon-General Wyman)	241-248

R.

Reedy Island Quarantine Station, report on (Passed Assistant Surgeon Woodward)	793, 794
Regulations Marine-Hospital Service:	
Amendment to	74
Additions and amendments to, for the management of the purveying depot	82, 83
Regulations:	
Quarantine, amendments and additions to	830, 832
Concerning consular bills of health	832, 833
Relief of families of deceased officers, measures for	18
Relief of sick, disabled, or destitute seamen in Cuban ports	73
Repairs of marine hospital	46-56
Baltimore, Md	46
Boston, Mass	47
Cairo, Ill	49
Chicago, Ill	49
Cincinnati, Ohio	49
Cleveland, Ohio	49
Detroit, Mich	50
Evansville, Ind	51
Key West, Fla	51
Louisville, Ky	51
Memphis, Tenn	52
Mobile, Ala	52
New Orleans, La	53

	Page.
Repairs of marine hospital—Continued.	
Portland, Me	53
Port Townsend, Wash	54
San Francisco, Cal	54
St. Louis, Mo	55
Vineyard Haven, Mass	56
Wilmington, N. C	56
Report—	
Of Surgeon-General to Secretary	13-863
On the fiftieth annual meeting of the American Medical Association (Surg. P. H. Bailhache)	19-21
Of Surg. C. E. Banks and P. A. Surg. J. J. Kinyoun, delegates to the National Pure Food and Drug Congress, held in Washington, D. C., January 18-21, 1899	21, 22
With inclosure on the proceedings of the International Conference for the Prevention of Venereal Disease, held at Brussels September, 1899, Surg. Eugene Wasdin	22-26
Of convention of health officers held in New Orleans, La., February 9, 1899, Surg. J. H. White	26-28
On the German Congress for Combating Tuberculosis, held in Berlin May 24-27, 1899, P. A. Surg. George T. Vaughan	28-38
Of purveying division	75-83
Of the cruise of the U. S. S. <i>McCullough</i> (by P. A. Surg. Joseph B. Greene)	306-312
Of inspection of Cuban quarantines (Passed Assistant Surgeon Rose- nan)	473
Of quarantine transactions at Habana (Acting Assistant Surgeon Dudley)	475-483
Of quarantine transactions at Matanzas and subports (P. A. Surg. G. M. Guiteras)	483-488
Of quarantine transactions at Neuviitas and subports (Assistant Sur- geon Richardson)	488-489
Of quarantine transactions at Santiago and subports (Assistant Sur- geon Parker)	490-505
Of quarantine transactions at Cienfuegos and subports (Assistant Surgeon Grubbs)	505-509
Of quarantine transactions at San Juan, P. R. (Surgeon Glennan)	513-519
Of quarantine transactions at Ponce, P. R. (Assistant Surgeon Lavin- der)	520-521
On measures to prevent introduction of yellow fever from Mexico (Assistant Surgeon Cofer)	525-520
Of quarantine transactions at Livingston, Gautemala (Acting Assist- ant Surgeon Vance)	545-547
Of quarantine transactions at Bluefields, Nicaragua (Acting Assistant Surgeon Goodman)	547
Of quarantine transactions at Belize, British Honduras (Acting Assist- ant Surgeon Knight)	548
Of quarantine transactions at Honolulu, Hawaii (Surgeon Car- michael)	550-551
Of quarantine transactions at Yokohama, Japan (Acting Assistant Surgeon Eldridge)	557-565
Of quarantine transactions at Hongkong, China (Passed Assistant Sur- geon Perry)	567-570
Of quarantine transactions at Naples, Italy (Assistant Surgeon Heiser)	577, 578
On plague in Oporto and conditions in Marseille and Barcelona (Sur- geon Irwin)	579-580
On post-epidemic disinfection (Surgeon Carter)	607-613
On post-epidemic aeration and disinfection (Surgeon Carter)	615, 616
Of quarantine of troops at Montauk Point, N. Y. (Passed Assistant Surgeon Magruder)	622-625
Of quarantine of troops at Savannah, Ga. (Passed Assistant Surgeon Cobb)	626, 627
Of quarantine of troops at Savannah, Ga. (Passed Assistant Surgeon Smith)	627-630
On detention of troops on Danfuskie Island, S. C. (Assistant Surgeon von Ezdorf)	630-635

Report—	Page.
On detention of troops at South Atlantic Quarantine Station (Assistant Surgeon Clark)	635, 636
On detention of troops at Tortugas Quarantine Station (Assistant Surgeon McAdam)	636, 637
Of disinfection of soldiers' baggage at Egmont Key, Fla., detention camp (Surgeon Carrington)	638, 639
On detention of troops at Egmont Key, Fla., detention camp (Assistant Surgeon Corput)	639-643
(Preliminary) on yellow fever in Soldiers' Home near Hampton, Va. (Surgeon Wasdin)	660, 661
(Final) on yellow fever in Soldiers' Home near Hampton, Va. (Surgeon Wasdin)	661, 662
On yellow fever in Soldiers' Home near Hampton, Va. (Passed Assistant Surgeon Wertenbaker)	668, 669
On yellow fever in Soldiers' Home near Hampton, Va. (Assistant Surgeon von Ezdorf)	670-679
On yellow fever in Soldiers' Home near Hampton, Va. (Surgeon Pettus)	680, 681
On yellow fever in Soldiers' Home near Hampton, Va. (Acting Assistant Surgeon Farquhar)	681, 682
On yellow fever in New Orleans and Jackson, La. (Surgeon Carter)	685
On yellow fever in Louisiana and Mississippi (Surgeon Carter)	685-694
On yellow fever in Key West, Fla. (Assistant Surgeon McAdam)	705, 706
On Tortugas detention camp (Passed Assistant Surgeon Smith)	715-718
On yellow fever in Miami, Fla. (Passed Assistant Surgeon Stimpson)	723, 724, 727-729, 731-733, 733-734, 735-737, 737-738
On yellow fever in Miami, Fla. (Assistant Surgeon von Ezdorf)	724-726
(Clinical) of a case of yellow fever in Miami, Fla. (Assistant Surgeon von Ezdorf)	729, 731, 734, 735
On detention camp McAdam (Passed Assistant Surgeon Stimpson)	740-743
On yellow fever in Port Tampa city, Fla. (Surgeon Carter)	744, 747
On smallpox in Virginia (Passed Assistant Surgeon Wertenbaker)	759, 761
On smallpox in Alexandria, Va. (Sanitary Inspector Snowden)	762, 763
On Reedy Island Quarantine Station (Passed Assistant Surgeon Woodward)	793, 794
On Delaware Breakwater Quarantine Station (Passed Assistant Surgeon Young)	794-797
On Cape Charles Quarantine Station (Surgeon Pettus)	797, 798
On Cape Fear Quarantine Station (Passed Assistant Surgeon Brown)	798, 799
On Savannah Quarantine Station (Acting Assistant Surgeon Linley)	799-801
On South Atlantic Quarantine Station (Passed Assistant Surgeon Cumming)	807, 810
On Brunswick Quarantine Station (Sanitary Inspector Burford)	810, 812
On Tortugas Quarantine Station (Assistant Surgeon Clark)	812, 816
On Gulf Quarantine Station (Surgeon Kalloch)	816, 817
On San Diego Quarantine Station (Acting Assistant Surgeon McKay)	817, 818
On San Francisco Quarantine Station (Surgeon Kinyoun)	819, 823
On Columbia River Quarantine Station (Assistant Surgeon Hastings)	825, 827
On Port Townsend Quarantine Station (Assistant Surgeon Foster)	827
(Passed Assistant Surgeon Perry)	828
On British Columbia quarantine at Williams Head (Assistant Surgeon Foster)	829
On hygienic laboratory (Acting Director Sprague)	846, 861
Reports—	
Of repairs of marine hospital	46-56
Of fatal cases with necropsies	93-221
On yellow fever in Soldiers' Home, near Hampton, Va. (Surgeon White)	663-668
Resignations	17
Revenue-Cutter Service:	
Aid to	39
Rules governing the physical examination of Naval Academy graduates seeking position in	75
Richardson, T. F., Asst. Surg., report of quarantine transaction at Nuevitas and subports	488, 489
Root, Hon. Elihu, letter to Secretary of Treasury relative to inspection at Hongkong and Yokohama of army transports from the Philippines	556

	Page.
Rosenau, M. J., P. A. Surg.:	
Detailed as inspecting quarantine officer for Cuba (Surgeon-General Wyman)	472
Inspecting quarantine officer in Cuba, letter of instructions to (Surgeon-General Wyman)	472
Report of inspection of Cuban quarantines	473
Rotterdam, report of method of inspection of emigrants at (Surgeon Wasdin)	584
Rules governing the physical examination of Naval Academy graduates seeking position in the Revenue-Cutter Service	75
Russell, H. C., Asst. Surg., report on marine hospital at Cairo, Ill.	48
S.	
St. Louis Marine Hospital (report of P. A. Surg. W. G. Stimpson)	55
<i>Sanator</i> , disinfecting steamer, description of (First Assistant Engineer Green, Revenue-Cutter Service)	834, 845
Sanatorium for tuberculous patients, establishment of, at Fort Stanton, N. Mex.	65-69
San Diego Quarantine Station, report on (Acting Assistant Surgeon McKay)	817-818
San Francisco Marine Hospital (report of Surg. J. M. Gassaway)	54
San Francisco, Cal.:	
Smallpox among soldiers	768, 769
Quarantine service at	823, 825
San Francisco Quarantine Station, report on (Surgeon Kinyoun)	819, 823
Sanitary reports and statistics, public-health service	389-467
San Juan, P. R.:	
Surgeon Glennan detailed as quarantine officer at	512
Report of quarantine transactions at (Surgeon Glennan)	513-519
Santiago, Cuba:	
Report of quarantine transactions at (Assistant Surgeon Parker)	490-505
Table of mortality statistics of	499-502
List of vessels in quarantine service employed at	511
Savannah, Ga.:	
Report of quarantine of troops at (Passed Assistant Surgeon Cobb) ..	626, 627
Report of quarantine of troops at (Passed Assistant Surgeon Smith) ..	627-630
Savannah Quarantine Station:	
Report on (Acting Assistant Surgeon Linley)	799, 801
Transfer of, to the Marine-Hospital Service	801-806
Sawtelle, H. W., Surg.:	
Report on marine hospital at Chicago, Ill.	49
Historical sketch of the service at Chicago, Ill.	249-253
Schedule of provisions (food) for seamen	44, 45
Seamen:	
Schedule of provisions (food) for	44, 45
Contracts for care of	57-64
Shelter for deck crews on western rivers	40-44
Shelter for crews on steamboats on the Ohio River, correspondence relative to	41-44
Smallpox:	
Instructions relative to diagnosis of	71
Circular letter relative to vaccination of crews of vessels	72
In foreign countries	406
Tabular statement	407-409
In the United States	755-793
Aid in suppression of	756-759
Vaccination	757, 758
In Virginia	759-761
Report on (Passed Assistant Surgeon Wertebaker)	759-761
In Alexandria, Va.	761-763
Report on (Sanitary Inspector Snowden)	762, 763
In Georgia	763-768
San Francisco, Cal., among soldiers	768, 769
Value of vaccination	769, 772
Precis upon the diagnosis and prevention of	772-781
Plan of organization for suppression of (Passed Assistant Surgeon Wertebaker)	781-793

	Page.
Smith, A. C., P. A. Surg.:	
Report of quarantine of troops at Savannah, Ga.	627-630
Report on Tortugas detention camp	715-718
Snowden, Arthur, sanitary inspector, report on smallpox in Alexandria, Va.	762, 763
Spain and Portugal, plague in	578
Spaulding, Hon. O. L., acting secretary:	
Letter to the Secretary of the Interior relative to the establishment of a sanatorium for tuberculous patients at Fort Stanton, N. Mex.	66
Letter to Secretary of State requesting consular reports of leprosy	419
Sprague, E. K., P. A. Surg., report on hygienic laboratory	846, 861
South Atlantic Quarantine Station:	
Report on detention of troops at (Assistant Surgeon Clark)	635, 636
Report on (Past Assistant Surgeon Cumming)	807, 810
Stations, marine hospital, inspection of	46
Statistics of the service (tables)	315-385
Statistics, mortality:	
Tables of	443-467
Santiago de Cuba, table of	499, 502
Steamboat-Inspection Service, aid to	39
Stevenson, H. W., Actg. Asst. Surg., report on marine hospital at Cincinnati, Ohio	49
Stewart, W. J. S., P. A. Surg., history of a case of arsenical poisoning	299-304
Stimpson, W. G., P. A. Surg.:	
Report on marine hospital at St. Louis, Mo.	53
Report on yellow fever in Miami, Fla.	723, 724, 727, 729, 731-733, 733-734, 735-737, 737-738
Report on McAdam detention camp	740, 743
Stoner, George W., Surg., article on the treatment of sick and wounded soldiers from Cuban battlefields	254-265

T.

Table:

Comparative, of number of seamen treated, 1868-1899	315
Seamen treated during fiscal year 1899	316
Seamen, physical examination of	320
Seamen treated during fiscal year 1899, by districts	320
Seamen, average duration of treatment of, in each district	321
Seamen, ratio of, treated in hospital in each district	321
North Atlantic district, number of patients treated in	321
Middle Atlantic district, number of patients treated in	328
South Atlantic district, number of patients treated in	336
Gulf district, number of patients treated in	343
Ohio district, number of patients treated in	350
Mississippi district, number of patients treated in	355
Great Lakes district, number of patients treated in	359
Pacific district, number of patients treated in	368
Quarantine, number of patients treated in	375
Surgical operations	379
Mortality per 100 seamen treated in hospitals, by districts, 1890-1899	384
Ratio of deaths of seamen from specific causes	384
Ratio of deaths of seamen in each district	384
Average duration of treatment of seamen in hospitals in each district, 1890-1899	385
Nativity of seamen treated in marine hospitals	385
Mortality statistics	443-467
Mortality statistics, Santiago de Cuba	499-502
Tabulated statement:	
By districts, of diseases and injuries treated during the fiscal year 1899	321
By districts, of causes of mortality among patients	377
Yellow fever in foreign countries	394
Plague in Arabia, China, India, Japan, and other countries	396
Smallpox in the United States	398-406
Smallpox in foreign countries	407-409
Epidemic dysentery in Japan	419
Cases of leprosy	440

	Page.
Texas-Mexican border, inspection of	748
Thomas, A. R., P. A. Surg., report on army transport service	588, 590
Tortugas detention camp, report on (Passed Assistant Surgeon Smith) ...	715, 718
Tortugas quarantine station:	
Report on (Assistant Surgeon Clark)	812, 816
Report on detention of troops at (Assistant Surgeon McAdam)	636, 637
Tuberculosis, congress for combating, held in Berlin, Germany, May 24-27, 1899	28-38
Tuberculous patients:	
Establishment of a sanatorium for, at Fort Stanton, N. Mex	65-69
Treatment of in separate wards	70

U.

United States:	
Smallpox in	755, 793
Yellow fever in	390
Tabulated statements of yellow fever in	391-393
Tabulated statement of smallpox in	398-406
United States Army transport service, reports on	586-605

V.

Vaccination	757-758
Value of	769, 772
Of crews of vessels, circular letter relative to	72
Vance, N. K., Actg. Asst. Surg., report of quarantine transactions at Liv- ingston, Guatemala	545-547
Vaughan, G. T., P. A. Surg.:	
Detailed to represent the Treasury Department at the tuberculosis congress held in Berlin, Germany, May 24-27, 1899	19
Report on German Congress for combating tuberculosis, held in Ber- lin May 24-27, 1899	28-38
Article on the climatic treatment of tuberculosis—Fort Stanton sana- tory ranch	287-290
Notes on surgical clinics in Berlin, Paris, and London	291-298
Vera Cruz, Mexico:	
Letter to Secretary of the Treasury relative to yellow fever in (Hon. Thomas. W. Cridler)	523
Letter to Secretary of State relative to yellow fever in (Hon. L. J. Gage)	523
Vineyard Haven Marine Hospital (report of Surg. F. W. Mead)	56
Virginia:	
Yellow fever in the National Soldiers' Home near Hampton	648, 682
Report on yellow fever in Soldiers' Home near Hampton (Passed As- sistant Surgeon Wertenbaker)	668, 669
(Assistant Surgeon von Ezdorf)	670-679
(Surgeon Pettus)	680, 681
(Acting Assistant Surgeon Farquhar)	681, 682
Smallpox in	759-761
Report on smallpox in (Passed Assistant Surgeon Wertenbaker) ...	759, 761
Smallpox in Alexandria	761, 763
Report on smallpox in Alexandria (Sanitary Inspector Snowden) ...	762, 763
von Ezdorf, R. H., Asst. Surg.:	
Report on detention of troops on Daufuskie Island, South Carolina .	630-635
Report on yellow fever in Soldiers' Home near Hampton, Va	670-679
Report on yellow fever in Miami, Fla	724, 726
Report (clinical) of a case of yellow fever in Miami, Fla	729, 731, 734-735

W.

Wailes, L. A., A. A. Surg., report of quarantine transactions at Puerto Cortez, Honduras	534-537
Wasdin, Eugene, Surg.:	
Report, with inclosure, on proceedings of the international confer- ence for the prevention of venereal disease, held at Brussels, Sep- tember, 1899	22-24

Wasdin, Eugene, Surg.—Continued.	Page.
Report of methods of inspection of emigrants at Bremen, Hamburg, Antwerp, and Rotterdam	582, 585
Preliminary report on yellow fever in Soldiers' Home near Hampton, Va	660, 661
Final report on yellow fever in Soldiers' Home near Hampton, Va	661, 663
Wertenbaker, C. P., P. A. Surg.:	
Report on marine hospital at Wilmington, N. C	56
Report on yellow fever in Soldiers' Home near Hampton, Va	668, 669
Report on smallpox in Virginia	759, 761
Plan of organization for suppression of smallpox	781-793
White, J. H., Surg.:	
Detailed to represent the service at a conference of health officers held in New Orleans, La., February 3, 1899	19
Report on convention of health officers held in New Orleans, La., February 9, 1899	26-28
Report on yellow fever in Soldiers' Home near Hampton, Va	663, 668
Wickes, H. W., P. A. Surg., report on marine hospital at Cleveland, Ohio	49
Wilmington Marine Hospital (report of P. A. Surg. C. P. Wertenbaker)	56
Woodward, R. M., P. A. Surg., report on Reedy Island Quarantine Station	793, 794
Wyman, Walter, Surg. Gen.:	
Report to Secretary	13-863
Circular letter announcing death of Asst. Surg. William Ralph McAdam	17, 18
Circular, contract for care of seamen	57-64
Letter relative to the establishment of a sanatorium for tuberculous patients at Fort Stanton, N. Mex	66-68
Circular letter relative to treatment of tuberculous patients in separate wards	70
Circular letter, instructions relative to diagnosis of smallpox	71
Circular letter relative to vaccination of crews of vessels	72
Circular letter relative to marking hospital furniture	72
Circular letter relative to use of bedside tables	72
Circular letter relative to copies of correspondence	73
Circular amending Marine-Hospital Service regulations	74
Address on quarantine and commerce	226-240
Address on quarantine and sanitation	241-248
Circular letter relative to cerebro-spinal meningitis	409
Letter of instructions to Surgeon Carter, detailed for duty in Cuba	469, 470
Letter to Sanitary Inspector Brunner, indorsing copy of War Department order relative to quarantine administration in Cuba	471
Letter detailing Passed Assistant Surgeon Rosenau as inspecting quarantine officer for Cuba	472
Letter of instructions to Passed Assistant Surgeon Rosenau, inspecting quarantine officer in Cuba	472
Letter detailing Surgeon Glennan as quarantine officer at San Juan, P. R	512
Telegram detailing Assistant Surgeon Cofer for duty in Mexico	524
Letter of instructions to Assistant Surgeon Cofer, detailed for duty in Mexico	524-525
Requesting appointment of acting assistant surgeons to serve at Central American ports	530
Letter relative to disinfection of rags at Alexandria and other ports in Egypt	571, 572
Letter relative to disinfection by areation in New Orleans, La	617
Y.	
Yellow fever:	
In the United States	390
In Soldiers' Home, near Hampton, Va	390
In District of Columbia	391
In Florida	391
In Louisiana	391
In Mississippi	391
In New York	392
In Ohio	392
In the United States, tabular statements of	391-393

Yellow fever—Continued.	Page.
In foreign countries	393
Tabular statement	394
In the National Soldiers' Home, near Hampton, Va	648, 682
Reports on (Surgeon White)	663, 668
Report on (Passed Assistant Surgeon Wertenbaker)	668-669
Report on (Assistant Surgeon von Ezdorf)	670-679
List of cases of and death from, in Soldiers' Home, near Hampton, Va	673, 674
In Soldiers' Home, near Hampton, Va., report on (Surgeon Pettus)	680, 681
Report on (Acting Assistant Surgeon Farquhar)	681, 682
In Louisiana and Mississippi	682-694
In New Orleans and Jackson, La., report on (Surgeon Carter)	685
In Louisiana and Mississippi, report on (Surgeon Carter)	685-694
In Key West, Fla	694-718
Report on (Assistant Surgeon McAdam)	705-706
In Miami, Fla	718-743
Report on (Passed Assistant Surgeon Stimpson)	723, 724, 727-729, 731-733, 733-734, 735-737, 737-738
Report on (Assistant Surgeon von Ezdorf)	724, 726
Report (clinical) of a case of, in Miami, Fla. (Assistant Surgeon von Ezdorf)	729, 731, 734, 735
Report on McAdam detention camp (Passed Assistant Surgeon Stimpson)	740, 743
At Port Tampa City, Fla	743, 748
In Port Tampa City, Fla., report on (Surgeon Carter)	744, 747
Yokohama, Japan:	
Report of quarantine transactions at (Acting Assistant Surgeon Eldridge)	557-565
Young, G. B., P. A. Surg:	
Report on Delaware Breakwater Quarantine Station	794, 797

Z.

Zavitziano, Dr. Spiridion C., United States Sanitary Commissioner at Constantinople	570
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